

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 r 1  
Edition : 03.06.91  
Replaces : 3.5.91  
Test oil : ISO-4113

Combination no. : 0 402 646 939

Injection pump  
Pump designation : PE6P120A320LS7836  
EP type number : 0 412 626 840  
Governor  
Governor design. : RQV300...950PA797-31  
Governor no. : 0 421 813 922

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.60

Del.quantity cm3/ : 18.2...18.4

100 s: (17.9...18.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.50

2nd speed rpm : 617

travel mm : 5.00...5.50

3rd speed rpm : 780

travel mm : 6.10...6.60

4th speed rpm : 1009

travel mm : 8.30...8.80

5th speed rpm : 1092

travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 850  
Del.quantity : 182.0...184.0  
1000 : (179.0...187.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 12.10  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 82...90

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 300  
Rack travel in mm : 5.20...5.80

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : -  
2nd speed rpm : 950  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 800  
Rack travel in m: 13.10...13.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 12.40...12.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 500  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1000

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Rack travel in m: 12.60...12.80  
4th pressure hPa : 1150  
Rack travel in m: 12.90...13.10  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1400  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 203.0...206.0  
1000 s: (200.0...209.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 L2  
 Edition : 27.05.91  
 Replaces : 22.3.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 941  
 Injection pump  
 Pump designation : PE6P120A320RS7218Z  
 EP type number : 0 412 626 847  
 Governor  
 Governor design. : RQ250/1000PA936-1  
 Governor no. : 0 421 801 508

Customer-spec. information  
 Customer : DAF

Engine : WS 222 G

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness : 8.00X2.50X1000  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 13.10...14.10

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Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 13.1...14.1  
 Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.60...13.70

Del.quantity cm3/ : 19.6...19.8

100 s: (19.3...20.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.6...6.8

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 196.0...198.0

1000 : (193.0...201.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.60  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
4th rack travel in: 1250  
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 990  
Rack travel in m: 14.50...14.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.60...13.70

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 390  
Rack travel in m: 13.30...13.40  
3rd pressure hPa : 310  
Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 161.0...163.0  
1000 s: (158.0...166.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,1 d  
Edition : 27.05.91  
Replaces : 26.4.91  
Test oil : ISO-4113

Combination no. : 0 402 646 942

Injection pump  
Pump designation : PE6P120A320LS7837  
EP type number : 0 412 626 842  
Governor  
Governor design. : RQ300/1050PA993  
Governor no. : 0 421 801 581

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.70...14.90

Del.quantity cm3/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.90  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.60...6.20  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 500  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 1250  
Rack travel in m: 14.80...15.00 \*  
4th pressure hPa : 1400  
Rack travel in m: 15.30...15.50  
5th pressure hPa : -  
Rack travel in m: 9.30...9.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800  
Speed rpm : 1050  
Del.quantity cm3/ : 235.0...238.0  
1000 s: (232.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm3/ : 248.0...252.0  
1000 s: (245.0...255.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

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\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,0 t12  
Edition : 27.05.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 945  
  
Injection pump  
Pump designation : PE6P120A320LS7808-2  
EP type number : 0 412 626 833  
Governor  
Governor design. : RQV350...950PA870-11  
Governor no. : 0 421 813 928

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 243.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.30...1.80

2nd speed rpm : 570

travel mm : 3.90...4.40

3rd speed rpm : 850

travel mm : 5.70...6.20

4th speed rpm : 1008

travel mm : 7.40...7.90

5th speed rpm : 1110

travel mm : 9.60...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 985

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 214.0...216.0  
1000 : (211.0...219.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 13.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

#### CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 550  
Rack travel in m: 13.10...13.30  
3rd pressure hPa : 1100  
Rack travel in m: 14.10...14.30  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

#### START CUT-OUT

A08

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm3/ : 241.0...243.0  
1000 s: (238.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm3/ : 237.0...241.0  
1000 s: (234.0...244.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm3/ : 200.0...202.0 \*  
1000 s: (197.0...205.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 j 2  
 Edition : 03.06.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 844A  
 Injection pump  
 Pump designation : PE8P120A32OLS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQ300/1050PA717-2  
 Governor no. : 0 421 801 439

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.10...13.30

Del.quantity cm3/ : 22.9...23.2

100 s: (22.6...23.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.5

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 229.0...232.0

1000 : (226.0...235.0)

Spread cm3 : 4.00

1000 : (7.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.90  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 13.90...14.60  
3rd speed rpm : 850  
Rack travel in m: 14.50...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.10...13.30

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 550  
Rack travel in m: 12.40...12.60  
3rd pressure hPa : 950  
Rack travel in m: 13.30...13.50  
4th pressure hPa : 1250  
Rack travel in m: 13.10...14.30  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1600

A10

Speed rpm : 1050  
Del.quantity cm3/ : 241.0...245.0  
1000 s: (238.0...248.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1600  
Speed rpm : 850  
Del.quantity cm3/ : 254.0...258.0  
1000 s: (251.0...261.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

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# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 j 3  
 Edition : 03.06.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 844  
 Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQ300/1050PA717-2  
 Governor no. : 0 421 801 439

Cust. part no. : T3

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 13.10...13.30  
 Del.quantity cm3/ : 22.5...22.8  
 100 s: (22.2...23.1)  
 Spread cm3 : 0.4  
 100 s: (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.5  
 100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 800  
 Del.quantity : 225.0...228.0  
 1000 : (222.0...231.0)  
 Spread cm3 : 4.00  
 1000 : (7.00)

## RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.90  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 13.90...14.60  
3rd speed rpm : 850  
Rack travel in m: 14.50...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.10...13.30

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 550  
Rack travel in m: 12.40...12.60  
3rd pressure hPa : 950  
Rack travel in m: 13.30...13.50  
4th pressure hPa : 1250  
Rack travel in m: 14.10...14.30  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1600  
Speed rpm : 850  
Del.quantity cm3/ : 261.0...265.0  
1000 s: (258.0...268.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 k 2  
 Edition : 03.06.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 845A  
 Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQV300...1050PA797-5  
 Governor no. : 0 421 813 702

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.10...13.30

Del.quantity cm3/ : 22.9...23.2

100 s: (22.6...23.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.5  
 100 s: (0.8)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40  
 2nd speed rpm : 800  
 travel mm : 5.80...6.10  
 3rd speed rpm : 1120  
 travel mm : 8.20...8.80  
 4th speed rpm : 1180  
 travel mm : 9.60...10.40

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 800

Del.quantity : 229.0...232.0  
1000 : (226.0...235.0)  
Spread cm3 : 4.00  
1000 : (7.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Dimension a mm : 1.30  
2nd speed rpm : 1050  
Rack travel in m: 13.90...14.10  
3rd speed rpm : 800  
Rack travel in m: 14.50...14.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.10...13.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 550  
Rack travel in m: 12.40...12.60  
3rd pressure hPa : 950  
Rack travel in m: 13.30...13.50  
4th pressure hPa : 1200  
Rack travel in m: 14.10...14.30

5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 241.0...245.0  
1000 s: (238.0...248.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 254.0...258.0  
1000 s: (251.0...261.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks: :

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 k 3  
 Edition : 03.06.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 845A3  
 Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQV300...1050PA797-5  
 Governor no. : 0 421 813 702

Cust. part no. : T3

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.10...13.30

Del.quantity cm3/ : 22.5...22.8

100 s: (22.2...23.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.40

2nd speed rpm : 800

travel mm : 5.80...6.10

3rd speed rpm : 1120

travel mm : 8.20...8.80

4th speed rpm : 1180

travel mm : 9.60...10.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800  
Del.quantity : 225.0...228.0  
1000 : (222.0...231.0)  
Spread cm3 : 4.00  
1000 : (7.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Dimension a mm : 1.30  
2nd speed rpm : 1050  
Rack travel in m: 13.90...14.10  
3rd speed rpm : 800  
Rack travel in m: 14.50...14.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.10...13.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 550  
Rack travel in m: 12.40...12.60  
3rd pressure hPa : 950  
Rack travel in m: 13.30...13.50  
4th pressure hPa : 1200

Rack travel in m: 14.10...14.30  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 261.0...265.0  
1000 s: (258.0...268.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 i 1  
Edition : 27.05.91  
Replaces : 26.4.91  
Test oil : ISO-4113

Combination no. : 0 402 648 846

Injection pump  
Pump designation : PE8P120A320LS7815  
EP type number : 0 412 628 827  
Governor  
Governor design. : RQV350...1050PA870-3  
Governor no. : 0 421 813 700

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442LA

1st version kW : 368.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 15.10...15.20

Del.quantity cm3/ : 25.8...26.0

100 s: (25.5...26.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.6

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.90...2.10

2nd speed rpm : 700  
travel mm : 4.10...4.50

3rd speed rpm : 1100  
travel mm : 7.60...8.00

4th speed rpm : 1200  
travel mm : 9.50...9.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h: 1500  
Del.quantity : 258.0...260.0  
1000 : (255.0...263.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 14.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.00...5.60

CONSTANT REGULATION  
Speed rpm : 350...600

TORQUE CONTROL  
Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 15.10...15.20  
2nd speed rpm : 1000  
Rack travel in m: 15.30...15.50  
3rd speed rpm : 800  
Rack travel in m: 15.40...15.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.40...14.60

Measurement  
Speed 1/min : 600

1st pressure hPa : 330  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 600

Rack travel in m: 13.00...13.20  
3rd pressure hPa : 1260  
Rack travel in m: 14.60...14.80  
4th pressure hPa : 1400  
Rack travel in m: 15.00...15.20  
5th pressure hPa : -  
Rack travel in m: 8.80...9.10

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 239.0...242.0  
1000 s: (236.0...245.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 266.0...270.0  
1000 s: (263.0...273.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 194.0...196.0 \*  
1000 s: (191.0...199.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (-)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:



\* = Set at reduced-delivery stop.





## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1150  
 Aneroid pressure h: 1300  
 Del.quantity : 307.0...309.0  
 1000 : (304.0...312.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

### RATED SPEED

#### 1st version

Control lever  
 position degrees: 118...126

#### Testing:

1st rack travel in: 12.80  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00  
 Speed rpm : 1295...1325  
 4th rack travel in: 1450  
 Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
 position degrees: 80...88

#### Testing:

Speed rpm : 100  
 Minimum rack trave: 8.90  
 Speed rpm : 250  
 Rack travel in mm : 7.30...7.50  
 Rack travel in mm : 2.00  
 Speed rpm : 430...490

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
 Speed rpm : 500  
 Pressure hPa : 1300  
 Rack travel mm : 13.80...13.90

#### Measurement

Speed 1/min : 500

#### 1st pressure hPa : -

Rack travel in m: 8.90...9.10  
 2nd pressure hPa : 100  
 Rack travel in m: 9.30...9.40  
 3rd pressure hPa : 470  
 Rack travel in m: 12.30...12.60

#### START CUT-OUT

Speed 1/min : 200 (220)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
 1000 s: (146.0...154.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than  
 full load rack tr: 12.80  
 Speed rpm : 1190...1200

### STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
 1000 s: (-)

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 0 \*\*  
 1000 s: (-)

### HIGH IDLE

#### 1st version

Speed rpm : 500  
 Rack travel in mm : < 7.00  
 Del.quantity cm<sup>3</sup>/ : 0 \*\*  
 1000 s: (-)

#### 2nd version

Speed rpm : 500  
 Rack travel in mm : < 7.50  
 Del.quantity cm<sup>3</sup>/ : < 50.0 \*\*  
 1000 s: (-)

#### 3rd version

Speed rpm : 500  
 Rack travel in mm : 8.30...8.50  
 Del.quantity cm<sup>3</sup>/ : 125.0...\*\*  
 1000 s: (-)

### LOW IDLE

Speed rpm : 250  
 Rack travel in mm : 7.30...7.50  
 Del.quantity cm<sup>3</sup>/ : 52.0...60.0  
 1000 s: (-)

#### Remarks:

: MAN-NR. 2-7944

\* applies to cylinders 2, 3, 4 and 8

\*\* applies for cylinders 1, 5, 6, and 7

APPLICATION

Ship

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 14,0 h7  
 Edition : 27.05.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 869

Injection pump  
 Pump designation : PE8P120A920/4LS7125  
 EP type number : 0 412 628 833  
 Governor  
 Governor design. : RQV200...1050PA736-7  
 Governor no. : 0 421 813 771

Customer-spec. information  
 Customer : SCANIA

Engine : DS14

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 13.50...13.60

---

Del.quantity cm3/ : 21.4...21.6  
 100 s: (21.1...21.9)

---

Spread cm3 : 0.6  
 100 s: (0.9)

---

2nd speed rpm : 225.0  
 Rack travel in mm : 5.0...5.6  
 Del.quantity cm3/ : 1.6...2.0  
 100 s: (-)  
 Spread cm3 : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.30...2.90  
 3rd speed rpm : 650  
 travel mm : 4.00...4.60  
 4th speed rpm : 1095  
 travel mm : 8.20...8.40  
 5th speed rpm : 1215  
 travel mm : 9.70...10.10

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 214.0...216.0  
 1000 : (211.0...219.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 40...48

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 365  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 215  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 208.0...216.0  
1000 s: (206.0...218.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

#### Remarks:

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 29, 1990

Start of delivery - engine: 16° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 v 2  
Edition : 27.05.91  
Replaces : 26.4.91  
Test oil : ISO-4113

Combination no. : 0 402 648 899

Injection pump  
Pump designation : PE8P120A320LS7839  
EP type number : 0 412 628 849  
Governor  
Governor design. : RQ300/950PA971-5  
Governor no. : 0 421 801 559

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.10...15.30

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1050

Del.quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.20

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1075...1105

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.5

Testing:

Speed rpm : 200

Minimum rack travel: 6.80

Speed rpm : 300

Rack travel in mm : 5.20...5.80

Rack travel in mm : 2.00

Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : -

2nd speed rpm : 950

Rack travel in m: 16.20...16.40

3rd speed rpm : 800

Rack travel in m: 16.20...16.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 1050

Rack travel mm : 15.10...15.30

Measurement

Speed 1/min : 600

1st pressure hPa : 350

Rack travel in m: 10.20...10.40

2nd pressure hPa : 800

Rack travel in m: 13.90...14.10

3rd pressure hPa : 1300

Rack travel in m: 15.30...15.50

4th pressure hPa : 1600

Rack travel in m: 15.90...16.10

5th pressure hPa : -

Rack travel in m: 9.40...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1900

Speed rpm : 950

Del.quantity cm3/ : 279.0...282.0

1000 s: (276.0...285.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 136.0...138.0

1000 s: (133.0...141.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.20

Speed rpm : 990...1005

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 v  
Edition : 27.05.91  
Replaces : 24.4.91  
Test oil : ISO-4113

Combination no. : 0 402 648 902

Injection pump  
Pump designation : PE8P120A32OLS7839  
EP type number : 0 412 628 849  
Governor  
Governor design. : RQ300/1050PA972-5  
Governor no. : 0 421 801 564

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.10...15.30

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1050

Del.quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.50  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 15.50...15.70  
3rd speed rpm : 800  
Rack travel in m: 15.70...15.90

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 100  
Pressure hPa : 1050  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 800  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1300  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1600  
Rack travel in m: 15.40...15.60  
5th pressure hPa : -  
Rack travel in m: 8.90...9.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1900  
Speed rpm : 1050

Del.quantity cm3/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1900  
Speed rpm : 800  
Del.quantity cm3/ : 276.0...280.0  
1000 s: (273.0...283.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.50  
Speed rpm : 1090...1105

Remarks:

:

## Note remarks

Combination no. : 0 402 648 907

1st version  
Speed rpm : 600  
Aneroid pressure h: 1050  
Del.quantity : 256.0...258.0  
1000 : (253.0...261.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 15.20  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.80  
Speed rpm : 300  
Rack travel in mm : 5.20...5.80

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Dimension a mm : -  
2nd speed rpm : 950  
Rack travel in m: 16.20...16.40  
3rd speed rpm : 800  
Rack travel in m: 16.20...16.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 15.10...15.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 800  
Rack travel in m: 13.90...14.10

3rd pressure hPa : 1300  
Rack travel in m: 15.30...15.50  
4th pressure hPa : 1600  
Rack travel in m: 15.90...16.10  
5th pressure hPa : -  
Rack travel in m: 9.40...9.70

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1900  
Speed rpm : 950  
Del.quantity cm3/ : 279.0...282.0  
1000 s: (276.0...285.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1900  
Speed rpm : 800

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 15.20  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 v 3  
 Edition : 03.06.91  
 Replaces : 28.3.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 911  
 Injection pump  
 Pump designation : PE8P120A320LS7839  
 EP type number : 0 412 628 849  
 Governor  
 Governor design. : RQV300...1050PA797-27  
 Governor no. : 0 421 813 916

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm<sup>3</sup>/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.2...5.8  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50  
 2nd speed rpm : 558  
 travel mm : 4.30...4.80  
 3rd speed rpm : 820  
 travel mm : 5.90...6.40  
 4th speed rpm : 1108  
 travel mm : 8.30...8.80  
 5th speed rpm : 1183  
 travel mm : 8.30...8.80

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 600  
Aneroid pressure h: 1050  
Del.quantity : 256.0...258.0  
1000 : (253.0...261.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 118...126

### Testing:

1st rack travel in: 14.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 76...84

### Testing:

Speed rpm : 200  
Minimum rack trave: 6.80  
Speed rpm : 300  
Rack travel in mm : 5.20...5.80

## CONSTANT REGULATION

Speed rpm : 300...450

## TORQUE CONTROL

Dimension a mm : 0.80  
2nd speed rpm : 1050  
Rack travel in m: 15.10...15.30  
3rd speed rpm : 800  
Rack travel in m: 15.90...16.10

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 14.60...14.80

## Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 800

B04

Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1300  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1600  
Rack travel in m: 15.40...15.60  
5th pressure hPa : -  
Rack travel in m: 8.90...9.20

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1900  
Speed rpm : 1050  
Del.quantity cm3/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1900  
Speed rpm : 800  
Del.quantity cm3/ : 276.0...280.0  
1000 s: (273.0...283.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 14.10  
Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...295.0  
1000 s: (260.0...280.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 17,2 f  
Edition : 03.06.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 648 912  
Injection pump  
Pump designation : PE8P130A920/5LS7841  
EP type number : 0 412 638 803  
Governor  
Governor design. : RQV300...950PA994K  
Governor no. : 0 421 815 275

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 8280.42.050

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 688 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 4- 3- 6- 5-  
7- 2

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 13.70...13.80

Del.quantity cm3/ : 22.3...22.6

100 s: (21.9...22.9)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 250.0

Rack travel in mm : 6.3...6.7

Del.quantity cm3/ : 2.0...2.6

100 s: (1.6...3.0)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 995  
travel mm : 10.20...10.40

2nd speed rpm : 300  
travel mm : 2.00...2.30

3rd speed rpm : 700  
travel mm : 5.80...6.20

4th speed rpm : 1200  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950

Aneroid pressure h: 900

Del.quantity : 223.0...226.0

1000 : (219.5...229.5)

Spread cm3 : 6.00

1000 : (10.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 111...119

### Testing:

1st rack travel in: 12.70  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 61...69

### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

## CONSTANT REGULATION

Speed rpm : 310...440

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 800  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 700  
Rack travel in m: 13.40...13.60  
4th speed rpm : 500  
Rack travel in m: 13.10...13.30

## Aneroid/Altitude Compensator Test

### 1st version

#### Setting

Speed rpm : 950  
Pressure hPa : 900  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 950

1st pressure hPa : -  
Rack travel in m: 10.40...10.60  
2nd pressure hPa : 380  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 260  
Rack travel in m: 11.10...11.50

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm3/ : 227.0...234.0  
1000 s: (223.5...237.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...147.0  
1000 s: (140.5...150.5)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 990...1000

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...250.0  
1000 s: (216.0...254.0)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 14,5 e1  
Edition : 27.05.91  
Replaces : 28.3.91  
Test oil : ISO-4113

Combination no. : 0 402 648 916

Injection pump  
Pump designation : PE8P120A520LS7818-1  
EP type number : 0 412 628 857  
Governor  
Governor design. : RQV250...1150PA902  
Governor no. : 0 421 813 720

Customer-spec. information  
Customer : MAN

Engine : D2848LXE 40

1st version kW : 500.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
                  : (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 30.7...30.9

100 s: (30.4...31.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 500  
Rack travel in mm : 8.90...9.10  
Del.quantity cm3/ : 14.9...15.1  
100 s: (14.6...15.4)

Spread cm3 : -0  
100 s: (-)

3rd speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 5.2...6.0 \*  
100 s: (-)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.40...1.60

2nd speed rpm : 450  
travel mm : 3.40...4.00

3rd speed rpm : 850  
travel mm : 6.30...6.90

4th speed rpm : 1150  
travel mm : 9.40...9.60

5th speed rpm : 1450  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1210  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 307.0...309.0  
1000 : (304.0...312.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 118...126

### Testing:

1st rack travel in: 12.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 80...88

### Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.80...13.90

## Measurement

Speed 1/min : 500

### 1st pressure hPa : -

Rack travel in m: 8.90...9.10

### 2nd pressure hPa : 100

Rack travel in m: 9.30...9.40

### 3rd pressure hPa : 470

Rack travel in m: 12.30...12.60

## START CUT-OUT

Speed 1/min : 200 (220)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.80

Speed rpm : 1190...1200

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 0 \*\*  
1000 s: (-)

## HIGH IDLE

### 1st version

Speed rpm : 500  
Rack travel in mm : < 7.00  
Del.quantity cm<sup>3</sup>/ : 0 \*\*  
1000 s: (-)

### 2nd version

Speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm<sup>3</sup>/ : < 50.0 \*\*  
1000 s: (-)

### 3rd version

Speed rpm : 500  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 125.0... \*\*  
1000 s: (-)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*  
1000 s: (-)

## Remarks:

: MAN-NR. 2-7944

\* applies to cylinders 2, 3, 4 and 8

\*\* applies for cylinders 1, 5, 6, and 7

APPLICATION

Ship



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 v 4  
Edition : 03.06.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 648 917

Injection pump  
Pump designation : PE8P120A320LS7839  
EP type number : 0 412 628 849  
Governor  
Governor design. : RQ300/1050PA993-3  
Governor no. : 0 421 801 601

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.10...15.30

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.2...6.8  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1050  
Del.quantity : 256.0...258.0  
1000 : (253.0...261.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.50  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 15.50...15.70  
3rd speed rpm : 800  
Rack travel in m: 15.70...15.90

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 800  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1300  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1600  
Rack travel in m: 15.40...15.60  
5th pressure hPa : -  
Rack travel in m: 8.90...9.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1900  
Speed rpm : 1050  
Del.quantity cm3/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1900  
Speed rpm : 800  
Del.quantity cm3/ : 276.0...280.0  
1000 s: (273.0...283.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.50  
Speed rpm : 1090...1105

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 w 3  
Edition : 03.06.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 648 918

Injection pump  
Pump designation : PE8P120A320LS7838  
EP type number : 0 412 628 848  
Governor  
Governor design. : RQ300/1050PA993-4  
Governor no. : 0 421 801 602

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 320.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
Rack travel in mm : 14.10...14.30  
Del.quantity cm3/ : 22.9...23.1  
100 s: (22.6...23.4)  
Spread cm3 : 0.6  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.2...6.8  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 1020  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del.quantity : 229.0...231.0  
1000 : (226.0...234.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 1020

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.50  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.50...14.70  
3rd speed rpm : 800  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 700  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 1200  
Rack travel in m: 14.30...14.50  
4th pressure hPa : 1350  
Rack travel in m: 14.70...14.90  
5th pressure hPa : -  
Rack travel in m: 9.20...9.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 226.0...229.0  
1000 s: (223.0...232.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 239.0...243.0  
1000 s: (236.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 138.0...140.0  
1000 s: (135.0...143.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1090...1105

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 18,2 h1  
Edition : 27.05.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 649 813

Injection pump  
Pump designation : PE10P120A520LS7825-1  
EP type number : 0 412 629 809  
Governor  
Governor design. : RQV250...1150PA902-3  
Governor no. : 0 421 813 761

Customer-spec. information  
Customer : MAN

Engine : D 2840 LXE

1st version kW : 603.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 10- 9- 4- 1- 8- 7-  
6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
216-261-288-333  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 28.4...28.6

100 s: (28.1...28.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 500  
Rack travel in mm : 8.80...9.00  
Del.quantity cm3/ : 14.9...15.1  
100 s: (14.6...15.4)

Spread cm3 : 0.8  
100 s: (1.2)

3rd speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 5.2...6.0 \*\*  
100 s: (-)

Spread cm3 : -  
100 s: (-)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.90...1.10

2nd speed rpm : 450  
travel mm : 2.90...3.50

3rd speed rpm : 750  
travel mm : 5.50...5.90

4th speed rpm : 1150  
travel mm : 9.20...9.40

5th speed rpm : 1400  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1225



Rack travel in mm : 15.20...17.80

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 284.0...286.0  
1000 : (281.0...289.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 118...126

##### Testing:

1st rack travel in: 12.00  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 76...84

##### Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.00...13.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 100  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 470  
Rack travel in m: 12.00...12.40

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...120.0\*\*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm3/ : 0 \*  
1000 s: (-)  
Rack travel in mm : 17.5...21.0

#### HIGH IDLE

##### 1st version

Speed rpm : 500  
Rack travel in mm : < 7.00  
Del.quantity cm3/ : 0 \*  
1000 s: (-)

##### 2nd version

Speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm3/ : < 50.0  
1000 s: (-)

##### 3rd version

Speed rpm : 500  
Rack travel in mm : 8.10...8.30  
Del.quantity cm3/ : 125.0...  
1000 s: (-)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 52.0...60.0 \*\*  
1000 s: (-)

Remarks:

: MAN-NR. 2-7961

\* applies to cylinders 1, 2, 3, 7 and 9

\*\* applies for cylinders 4, 5, 6, 8 and 10

APPLICATION

Ship

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 g 9  
 Edition : 27.05.91  
 Replaces : 26.4.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 678 814  
 Injection pump  
 Pump designation : PE8P120A320LS7801-2  
 EP type number : 0 412 628 825  
 Governor  
 Governor design. : RSV350...1050POA535-4  
 Governor no. : 0 421 833 352

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442LA

1st version kW : 260.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness : 6.00X1.50X1000  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (4.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 700

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 90...98

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1140...1158  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 370...430

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.50...12.70  
2nd speed rpm : 700  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 900  
Rack travel in m: 13.30...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 13.90...14.10

Measurement  
Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 925  
Rack travel in m: 14.00...14.10 \*  
3rd pressure hPa : -  
Rack travel in m: 10.80...11.10

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 1030  
Del.quantity cm3/ : 181.0...184.0  
1000 s: (178.0...187.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 700  
Del.quantity cm3/ : 213.0...217.0  
1000 s: (210.0...220.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 143.0...145.0  
1000 s: (140.0...148.0)  
Spread cm3 : 8.00  
1000 s: (-)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...200.0  
1000 s: (176.0...204.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 t  
Edition : 05.06.91  
Replaces : 18.1.91  
Test oil : ISO-4113

Combination no. : 0 402 736 808

Injection pump  
Pump designation : PES6P120A720/3LS7209  
EP type number : 0 412 726 837  
Governor  
Governor design. : RQV300...1000PA962-1  
K  
Governor no. : 0 421 815 248

Customer-spec. information  
Customer : MAN

Engine : D2866LF06

1st version kW : 309.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 15.00...16.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 28.5...28.7

100 s: (28.2...29.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 4.8...5.2  
Del.quantity cm3/ : 2.0...2.6  
100 s: (1.7...2.9)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
travel mm : 8.40...8.60  
2nd speed rpm : 300  
travel mm : 2.10...2.30  
3rd speed rpm : 500  
travel mm : 4.10...4.50  
4th speed rpm : 900  
travel mm : 6.50...6.90  
5th speed rpm : 1350  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1140  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900

Aneroid pressure h: 1300  
Del.quantity : 285.0...287.0  
1000 : (282.0...290.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 284...292

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 240...248

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 320...440

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 1000  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 750  
Rack travel in m: 12.70...12.90  
4th speed rpm : 400  
Rack travel in m: 11.50...11.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1300  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.80...9.00

2nd pressure hPa : 220  
Rack travel in m: 9.10...9.20  
3rd pressure hPa : 720  
Rack travel in m: 11.40...11.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1300  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 261.0...265.0  
1000 s: (258.0...268.0)  
Aneroid pressure h: 1300  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 271.0...277.0  
1000 s: (268.0...280.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 166.0...168.0  
1000 s: (163.0...171.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MAN-NR. 2-7987

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 12,0 i  
Edition : 03.06.91  
Replaces : 16.2.90  
Test oil : ISO-4113

Combination no. : 0 402 746 878

Injection pump  
Pump designation : PES6P120A320RS7191  
EP type number : 0 412 726 828  
Governor  
Governor design. : RQV275...1000PA927  
Governor no. : 0 421 813 808

Customer-spec. information  
Customer : RVI

Engine : MIDR 06-35-40

1st version kW : 314.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 12.50...13.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 27.8...28.0

100 s: (27.5...28.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275%

Rack travel in mm : 4.50...4.90

Del.quantity cm3/ : 2.1...2.7

100 s: (1.8...3.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 1.10...1.50

2nd speed rpm : 500  
travel mm : 3.60...4.20

3rd speed rpm : 700  
travel mm : 5.50...5.90

4th speed rpm : 1000  
travel mm : 7.60...7.80

5th speed rpm : 1400  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 278.0...280.0

1000 : (275.0...283.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 300...308

#### Testing:

1st rack travel in: 13.10  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 245...253

#### Testing:

Speed rpm : 200  
Minimum rack travel: 5.90  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 330...430

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.00...14.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 520  
Rack travel in m: 13.30...13.40  
3rd pressure hPa : 200  
Rack travel in m: 10.60...11.00

#### START CUT-OUT

Speed 1/min : 225 (245)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000

Del.quantity cm3/ : 271.0...277.0  
1000 s: (268.0...280.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 153.0...155.0  
1000 s: (150.0...158.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack travel: 13.00  
Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...175.0  
1000 s: (141.0...179.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : -9.10...-9.50  
Del.quantity cm3/ : 21.0...27.0  
1000 s: (18.0...30.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 7,8 k  
Edition : 27.05.91  
Replaces : 16.11.90  
Test oil : ISO-4113

Combination no. : 0 402 746 889

Injection pump  
Pump designation : PES6P120A720RS7179  
EP type number : 0 412 726 826  
Governor  
Governor design. : RQV350...1000PA917-1  
K  
Governor no. : 0 421 815 236

Customer-spec. information  
Customer : FNH

Engine : 7.8L

1st version kW : 160.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 072

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 4.35...4.45  
: (4.30...4.50)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm3 : 0.7

100 s: (1.1)

2nd speed rpm : 350.0  
Rack travel in mm : 5.0...5.4  
Del.quantity cm3/ : 2.0...2.6  
100 s: (1.8...2.8)  
Spread cm3 : 0.5  
100 s: (0.9)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 2.10...2.40  
2nd speed rpm : 450  
travel mm : 3.50...3.90  
3rd speed rpm : 800  
travel mm : 6.90...7.30  
4th speed rpm : 1000  
travel mm : 8.60...8.80  
5th speed rpm : 1200  
travel mm : 10.70...11.10

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1230  
Rack travel in mm : 6.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

#### 1st version

Speed rpm : 1000  
Aneroid pressure h: 1400  
Del.quantity : 163.0...165.0  
1000 : (160.0...168.0)  
Spread cm3 : 7.00  
1000 : (11.00)

#### RATED SPEED

#### 1st version

Control lever  
position degrees: 112...120

#### Testing:

1st rack travel in: 11.80  
Speed rpm : 1050...1060  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 63...71

#### Testing:

Speed rpm : 275  
Minimum rack travel: 6.70  
Speed rpm : 350  
Rack travel in mm : 5.00...5.40

#### CONSTANT REGULATION

Speed rpm : 320...500

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 750  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 650  
Rack travel in m: 12.70...13.10

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 750  
Pressure hPa : 1400  
Rack travel mm : 13.30...13.50

#### Measurement

Speed 1/min : 750

1st pressure hPa : -

B24

Rack travel in m: 8.50...8.90  
2nd pressure hPa : 565  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 715  
Rack travel in m: 10.90...11.30

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm3/ : 190.0...196.0  
1000 s: (187.0...199.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 106.0...108.0  
1000 s: (103.0...111.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1050...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...180.0  
1000 s: (146.0...186.0)  
Rack travel in mm : 10.90...11.50

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.00...5.40  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (18.0...28.0)  
Spread cm3 : 5.00  
1000 s: (9.50)

#### Remarks:

: FNH # E9HN-9A543-PA

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 i  
Edition : 03.06.91  
Replaces : 27.2.91  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 901  
  
Injection pump  
Pump designation : PES6P120A72ORS7224  
EP type number : 0 412 726 840  
Governor  
Governor design. : RQV275...1100PA975K  
Governor no. : 0 421 815 266

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8460.41.406

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
: (5.05...5.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.1...5.5

Del.quantity cm3/ : 3.2...3.8

100 s: (2.9...4.1)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145

travel mm : 10.30...10.50

2nd speed rpm : 275

travel mm : 1.30...1.50

3rd speed rpm : 450

travel mm : 3.40...4.00

4th speed rpm : 750

travel mm : 5.90...6.30

5th speed rpm : 1350

travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00

CONSTANT REGULATION  
Speed rpm : 270...400

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 900  
Rack travel in m: 12.30...12.60  
3rd speed rpm : 700  
Rack travel in m: 11.90...12.10  
4th speed rpm : 500  
Rack travel in m: 11.20...11.50  
5th speed rpm : 350  
Rack travel in m: 10.80...11.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 12.40...12.50

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 7.60...7.80

2nd pressure hPa : 710  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 400  
Rack travel in m: 8.60...9.00

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (146.0...184.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (29.0...41.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 i 1  
 Edition : 03.06.91  
 Replaces : 1.3.91  
 Test oil : ISO-4113

Combination no. : 0 402 746 902

Injection pump  
 Pump designation : PES6P120A720RS7224  
 EP type number : 0 412 726 840  
 Governor  
 Governor design. : RQV275...1100PA975-1  
 K  
 Governor no. : 0 421 815 267

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.41.320

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
 : (5.05...5.25)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 11.20...11.30

---

Del.quantity cm3/ : 20.9...21.1  
 100 s: (20.6...21.4)

---

Spread cm3 : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 275.0  
 Rack travel in mm : 5.1...5.5  
 Del.quantity cm3/ : 3.2...3.8  
 100 s: (2.9...4.1)

---

Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
 travel mm : 10.30...10.50  
 2nd speed rpm : 275  
 travel mm : 1.30...1.50  
 3rd speed rpm : 450  
 travel mm : 3.40...4.00  
 4th speed rpm : 750  
 travel mm : 5.90...6.30  
 5th speed rpm : 1350  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1140  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del.quantity : 209.0...211.0  
 1000 : (206.0...214.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 10.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...72

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00

#### CONSTANT REGULATION

Speed rpm : 270...400

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 900  
Rack travel in m: 10.70...10.90  
3rd speed rpm : 700  
Rack travel in m: 9.90...10.10  
4th speed rpm : 400  
Rack travel in m: 9.30...9.70

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 11.20...11.30

##### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.70...7.90  
2nd pressure hPa : 600  
Rack travel in m: 10.60...10.70

3rd pressure hPa : 420  
Rack travel in m: 9.10...9.50

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 188.0...194.0  
1000 s: (185.0...197.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (117.0...125.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1140...1150

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (29.0...41.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 i 2  
 Edition : 03.06.91  
 Replaces : 1.3.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 903  
 Injection pump  
 Pump designation : PES6P120A720RS7224  
 EP type number : 0 412 726 840  
 Governor  
 Governor design. : RQV275...1100PA888-1  
 K  
 Governor no. : 0 421 815 268  
 Customer spec. information  
 Customer : IVECO-UNIC  
 Engine : 8460.41.160

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
 : (5.05...5.25)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 22.4...22.6

100 s: (22.1...22.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.2...5.6

Del.quantity cm3/ : 3.0...3.6

100 s: (2.7...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
 travel mm : 10.10...10.30

2nd speed rpm : 275  
 travel mm : 1.10...1.30

3rd speed rpm : 400  
 travel mm : 2.50...3.10

4th speed rpm : 750  
 travel mm : 5.50...5.90

5th speed rpm : 1350  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 224.0...226.0

1000 : (221.0...229.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 275  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 270...400

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 1100  
Rack travel in m: 11.60...11.80  
3rd speed rpm : 700  
Rack travel in m: 11.20...11.40  
4th speed rpm : 400  
Rack travel in m: 10.70...11.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 850  
Pressure hPa : 900  
Rack travel mm : 11.80...11.90

Measurement  
Speed 1/min : 850

1st pressure hPa : -  
Rack travel in m: 8.10...8.30  
2nd pressure hPa : 640  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 400

C02

Rack travel in m: 8.90...9.20

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm3/ : 210.0...216.0  
1000 s: (207.0...219.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 127.0...129.0  
1000 s: (124.0...132.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1140...1150

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.20...5.60  
Del.quantity cm3/ : 30.0...36.0  
1000 s: (27.0...39.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 g  
Edition : 27.05.91  
Replaces : 16.1.91  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 904  
  
Injection pump  
Pump designation : PES6P120A720RS7154  
EP type number : 0 412 726 811  
Governor  
Governor design. : RQ275/1100PA980  
Governor no. : 0 421 801 555

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8460.41.101

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 19.3...19.5

100 s: (19.0...19.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.8...5.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 193.0...195.0

1000 : (190.0...198.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.60

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1225...1255

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 330...370

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 600  
Rack travel in m: 11.60...11.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.60...11.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 415  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 320  
Rack travel in m: 9.90...10.20

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 127.0...129.0  
1000 s: (124.0...132.0)

BREAKAWAY

CO4

1st version  
1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...200.0  
1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.80...5.20  
Del.quantity cm3/ : 16.0...22.0  
1000 s: (13.0...25.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 8,8 S 3  
Edition : 03.06.91  
Replaces : 18.02.91  
Test oil : ISO-4113

Combination no. : 0 403 446 235

Injection pump  
Pump designation : PES6MW100/32ORS1171  
EP type number : 0 413 406 156  
Governor  
Governor design. : RGV300...1300MW80-5  
Governor no. : 0 420 083 197

Customer-spec. information  
Customer : RVI

Engine : MIDS 060212B

1st version kW : 113.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.40...5.80

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1500  
travel mm : 8.70...9.10

2nd speed rpm : 1350  
travel mm : 7.60...7.80

3rd speed rpm : 500  
travel mm : 2.80...3.40

4th speed rpm : 300  
travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 700  
Del.quantity : 88.0...90.0  
1000 : (86.0...92.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:

1st rack travel in: 9.80  
Speed rpm : 1390...1400  
2nd rack travel in: 4.00  
Speed rpm : 1505...1535  
4th rack travel in: 1700  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.80...8.90

Measurement

Speed 1/min : 500

1st pressure hPa : 100  
Rack travel in m: 9.30...9.40  
2nd pressure hPa : 200  
Rack travel in m: 10.20...10.50  
3rd pressure hPa : 700  
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 900  
Del.quantity cm3/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 47.0...49.0  
1000 s: (45.0...51.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1390...1400

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (87.0...113.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.40...5.80  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark made with  
prestroke 3.00...3.10 mm at barrel 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 8,1 D  
 Edition : 03.06.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 249  
 Injection pump  
 Pump designation : PES6MW100/720RS1197  
 EP type number : 0 413 406 185  
 Governor  
 Governor design. : RQV325...1350MW109K  
 Governor no. : 0 420 083 997

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8060.45.6700

1st version kW : 165.0  
 Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1350  
 Rack travel in mm : 14.00...14.10  
 Del.quantity cm<sup>3</sup>/ : 10.0...10.2  
 100 s: (9.8...10.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.7...7.9  
 Del.quantity cm<sup>3</sup>/ : 2.5...2.9  
 100 s: (2.2...3.1)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1400  
 travel mm : 10.00...10.40  
 2nd speed rpm : 825  
 travel mm : 4.90...5.10  
 3rd speed rpm : 400  
 travel mm : 2.90...3.50  
 4th speed rpm : 325  
 travel mm : 1.50...1.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1410  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1350  
 Aneroid pressure h: 850  
 Del.quantity : 100.0...102.0  
 1000 : (98.0...104.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1410...1420  
2nd rack travel in: 4.00  
Speed rpm : 1495...1525  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.8

Testing:  
Speed rpm : 200  
Minimum rack trave: 10.00  
Speed rpm : 325  
Rack travel in mm : 7.70...7.90

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1350  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1200  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 1000  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 13.30...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 11.70...11.80  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.10  
3rd pressure hPa : 850  
Rack travel in m: 13.30...13.50

## FUEL DELIVERY CHARACTERISTICS

C08

1st version  
Aneroid pressure h: 850  
Speed rpm : 1200  
Del.quantity cm3/ : 102.5...105.5  
1000 s: (100.0...108.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 850  
Speed rpm : 1000  
Del.quantity cm3/ : 101.5...104.5  
1000 s: (99.0...107.0)  
Aneroid pressure h: 850  
Speed rpm : 600  
Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.5...79.5  
1000 s: (75.5...81.5)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1410...1420

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 65.0...85.0  
1000 s: (62.0...88.0)

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.70...7.90  
Del.quantity cm3/ : 25.0...29.0  
1000 s: (22.5...31.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 D 3  
Edition : 03.06.91  
Replaces : 19.03.91  
Test oil : ISO-4113

Combination no. : 0 403 446 279

Injection pump  
Pump designation : PES6MW100/720RS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RQV300...1200MW105-6  
Governor no. : 0 420 082 054

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 115.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 715 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 8.80...9.20

2nd speed rpm : 1200

travel mm : 7.40...7.60

3rd speed rpm : 700

travel mm : 6.70...7.30

4th speed rpm : 450

travel mm : 5.10...5.70

5th speed rpm : 300

travel mm : 2.60...3.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 800

Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 94...102

Testing:  
1st rack travel in: 9.20  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1305...1335  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 410...470

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 600  
Rack travel in m: 10.90...11.10  
3rd speed rpm : 1100  
Rack travel in m: 10.30...10.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 8.90...9.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.60...8.70  
2nd pressure hPa : 350  
Rack travel in m: 10.20...10.50  
3rd pressure hPa : 700  
Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 200 (230)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 78.0...81.0  
1000 s: (75.5...83.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 44.0...46.0  
1000 s: (42.0...48.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 6,2 F  
Edition : 27.05.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 281

Injection pump  
Pump designation : PES6MW100/720RS1217  
EP type number : 0 413 406 207  
Governor  
Governor design. : RQ300/1000MW116  
Governor no. : 0 420 082 056

Customer-spec. information  
Customer : MWM

Engine : TBD226B-6

1st version kW : 150.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
: (3.95...4.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1100

travel mm : 7.30...7.70

2nd speed rpm : 1000

travel mm : 5.90...6.10

3rd speed rpm : 370

travel mm : 4.70...5.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 144.0...146.0

1000 : (142.0...148.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 91...99

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.40  
Speed rpm : 1040...1055  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 28...36  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.70...8.80

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.50...9.70  
2nd pressure hPa : 650  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1200  
Rack travel in m: 12.40...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 143.5...146.5  
1000 s: (141.0...149.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 64.0...66.0  
1000 s: (62.0...68.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1040...1055

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 W 8  
 Edition : 27.05.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 282  
 Injection pump  
 Pump designation : PES6MW100/320RS1198  
 EP type number : 0 413 406 188  
 Governor  
 Governor design. : RQV350...1200MW46-39  
 Governor no. : 0 420 083 246

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 186.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 13.0...13.2

100 s: (12.8...13.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.80...10.20

2nd speed rpm : 1250

travel mm : 7.90...8.10

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1200

Del.quantity : 130.0...132.0

1000 : (128.0...134.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 11.10  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1400...1410  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.10...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 225  
Rack travel in m: 9.80...9.90  
2nd pressure hPa : 490  
Rack travel in m: 11.20...11.60  
3rd pressure hPa : 1200  
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 126.5...130.5  
1000 s: (124.5...132.5)  
Spread cm3 : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 69.5...71.5  
1000 s: (67.5...73.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...190.0  
1000 s: (145.0...195.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1817694C91

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.

In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 W 7  
 Edition : 27.05.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 283  
 Injection pump  
 Pump designation : PES6MW100/32ORS1198  
 EP type number : 0 413 406 188  
 Governor  
 Governor design. : RQV350...1200MW46-40  
 Governor no. : 0 420 083 247

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 186.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm3/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.80...10.20  
 2nd speed rpm : 1250  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 1200  
 Del.quantity : 133.5...135.5  
 1000 : (131.5...137.5)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 102...110

Testing:

1st rack travel in: 11.50  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1400...1410  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.00...9.10

Measurement

Speed 1/min : 500

1st pressure hPa : 335  
Rack travel in mm: 10.00...10.10  
2nd pressure hPa : 645  
Rack travel in mm: 11.40...11.80  
3rd pressure hPa : 1200  
Rack travel in mm: 12.50...12.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1200  
Del. quantity cm<sup>3</sup>/ : 130.0...134.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 68.0...70.0  
1000 s: (66.0...72.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 150.0...190.0  
1000 s: (145.0...195.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del. quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1817695C91

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.

In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 Q  
Edition : 27.05.91  
Replaces : 17.09.90  
Test oil : ISO-4113

Combination no. : 0 403 456 111

Injection pump  
Pump designation : PES6MW100/321RS1186  
EP type number : 0 413 406 168  
Governor  
Governor design. : RQ250/1200MW84-4  
Governor no. : 0 420 082 044

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH

1st version kW : 157.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.70...14.80

Del.quantity cm3/ : 12.6...12.8

100 s: (12.4...13.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1230

travel mm : 9.50...9.90

2nd speed rpm : 1250

travel mm : 7.50...7.70

3rd speed rpm : 350

travel mm : 5.20...5.80

4th speed rpm : 250

travel mm : 2.20...2.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 1200

Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 126.0...128.0

1000 : (124.0...130.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 104...112

Setting point:

Speed rpm : 1200

Rack travel in mm : 15.5

Testing:

1st rack travel in: 13.30

Speed rpm : 1245...1260

2nd rack travel in: 4.00

Speed rpm : 1290...1320

4th rack travel in: 1450

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 70...78

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.6

Testing:

Speed rpm : 100

Minimum rack travel: 7.00

Speed rpm : 250

Rack travel in mm : 5.50...5.70

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in mm : 14.70...14.80

2nd speed rpm : 600

Rack travel in mm : 14.80...14.90

3rd speed rpm : 800

Rack travel in mm : 14.80...14.90

4th speed rpm : 1200

Rack travel in mm : 14.30...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 200

Rack travel mm : 12.70...12.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in mm : 12.30...12.40

2nd pressure hPa : 400

Rack travel in mm : 13.80...14.10

3rd pressure hPa : 1000

Rack travel in mm : 14.80...14.90

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 126.5...129.5

1000 s: (124.0...132.0)

Spread cm<sup>3</sup> : 5.00

1000 s: (7.0)

Aneroid pressure h: 1000

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 126.5...129.5

1000 s: (124.0...132.0)

Aneroid pressure h: 1000

Speed rpm : 1200

Del.quantity cm<sup>3</sup>/ : 123.0...126.0

1000 s: (120.5...128.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 74.0...76.0

1000 s: (72.0...78.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack travel: 13.30

Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 130.0...140.0

1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.50...5.70

Del.quantity cm<sup>3</sup>/ : 19.0...23.0

1000 s: (16.5...25.5)

Spread cm<sup>3</sup> : 3.50

1000 s: (5.50)

Remarks:

: MAN #3-7008

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1



start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 C  
Edition : 03.06.91  
Replaces : 19.03.91  
Test oil : ISO-4113

Combination no. : 0 403 456 113

Injection pump  
Pump designation : PES6MW100/321RS1210  
EP type number : 0 413 406 201  
Governor  
Governor design. : RQ250/1050MW84-6  
Governor no. : 0 420 082 049

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH 250

1st version kW : 184.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 15.9...16.1

100 s: (15.7...16.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1125

travel mm : 7.30...7.70

2nd speed rpm : 1050

travel mm : 6.10...6.30

3rd speed rpm : 400

travel mm : 5.70...6.30

4th speed rpm : 250

travel mm : 2.50...2.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 98

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1100

Del.quantity : 159.0...161.0

1000 : (157.0...163.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 95...103

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00

Speed rpm : 1075...1090

2nd rack travel in: 4.00

Speed rpm : 1130...1160

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 72...80

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.0

Testing:

Speed rpm : 100

Minimum rack travel: 7.50

Speed rpm : 250

Rack travel in mm : 4.90...5.10

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 14.00...14.10

2nd speed rpm : 600

Rack travel in m: 14.00...14.10

3rd speed rpm : 800

Rack travel in m: 14.00...14.10

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 150

Rack travel mm : 9.50...9.60

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.20...9.30

2nd pressure hPa : 700

Rack travel in m: 12.80...13.10

3rd pressure hPa : 1100

Rack travel in m: 14.00...14.10

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 162.0...165.0

1000 s: (159.5...167.5)

Spread cm<sup>3</sup> : 5.00

1000 s: (7.0)

Aneroid pressure h: 1100

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 161.0...164.0

1000 s: (158.5...166.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 67.0...69.0

1000 s: (65.0...71.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 1075...1090

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 80.0...100.0

1000 s: (77.0...103.0)

## LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.90...5.10

Del.quantity cm<sup>3</sup>/ : 13.0...17.0

1000 s: (10.5...19.5)

Spread cm<sup>3</sup> : 3.50

1000 s: (5.50)

Remarks:

: MAN #3-7127

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 D  
Edition : 27.05.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 456 115

Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQ250/1200MW84-7  
Governor no. : 0 420 082 055

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH 01

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/ : 16.3...16.5

100 s: (16.1...16.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 6.2...6.4

Del.quantity cm3/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.30...9.70

2nd speed rpm : 1255

travel mm : 6.50...6.70

3rd speed rpm : 360

travel mm : 3.90...4.50

4th speed rpm : 250

travel mm : 1.60...2.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (161.0...167.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 94...102

### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 12.60  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 32...40  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.3

### Testing:

Speed rpm : 150  
Minimum rack travel: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 220  
Rack travel mm : 10.30...10.40

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 750  
Rack travel in m: 12.60...12.90  
3rd pressure hPa : 1200  
Rack travel in m: 13.60...13.70

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 167.0...170.0  
1000 s: (164.5...172.5)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 163.0...166.0  
1000 s: (160.5...168.5)  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 160.0...163.0  
1000 s: (157.5...165.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.0...79.0  
1000 s: (75.0...81.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

### Remarks:

: MAN #3-7126  
Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 D 1  
Edition : 03.06.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 456 116  
Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQ250/1200MW84-7  
Governor no. : 0 420 082 055

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH 04

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/ : 16.3...16.5

100 s: (16.1...16.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 6.2...6.4

Del.quantity cm3/ : 2.1...2.5

100 s: (1.8...2.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320  
travel mm : 9.30...9.70

2nd speed rpm : 1255  
travel mm : 6.50...6.70

3rd speed rpm : 360  
travel mm : 3.90...4.50

4th speed rpm : 250  
travel mm : 1.60...2.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 107

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (161.0...167.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 94...102

### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 12.60  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 32...40  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.3

### Testing:

Speed rpm : 150  
Minimum rack travel: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 220  
Rack travel mm : 10.30...10.40

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 750  
Rack travel in m: 12.60...12.90  
3rd pressure hPa : 1200  
Rack travel in m: 13.60...13.70

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 167.0...170.0  
1000 s: (164.5...172.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 163.0...166.0  
1000 s: (160.5...168.5)  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 160.0...163.0  
1000 s: (157.5...165.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (75.0...81.0)

## BREAKAWAY

## 1st version

1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del.quantity cm<sup>3</sup>/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

### Remarks:

: MAN #3-7137  
Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 B  
Edition : 03.06.91  
Replaces : 14.07.89  
Test oil : ISO-4113

Combination no. : 0 403 474 008

Injection pump  
Pump designation : PES4MW100/720RS1181  
EP type number : 0 413 404 107  
Governor  
Governor design. : RSV400...1000MW1A333  
Governor no. : 0 420 085 118

Customer-spec. information  
Customer : LIEBHERR

Engine : 914

1st version kW : 120.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.70...11.80

Del.quantity cm3/ : 14.6...14.8

100 s: (14.4...15.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 146.0...148.0

1000 : (144.0...150.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 46...54

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:



1st rack travel in: 10.70  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1275  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 600  
Rack travel in m: 11.70...11.80  
5th speed rpm : 400  
Rack travel in m: 13.20...13.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 145.5...148.5  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 8,4 E  
Edition : 03.06.91  
Replaces : 05.11.90  
Test oil : ISO-4113

Combination no. : 0 403 474 012

Injection pump  
Pump designation : PES4MW100/720r.51207  
EP type number : 0 413 404 113  
Governor  
Governor design. : RSV350...1000MWOA333  
-1  
Governor no. : 0 420 085 153

Customer-spec. information  
Customer : LIEBHERR

Engine : D 914 T

1st version kW : 110.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
: (3.25...3.45)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1275  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 390...450

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 700  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 500  
Rack travel in m: 11.50...11.60  
5th speed rpm : 400  
Rack travel in m: 13.00...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm3/ : 132.0...135.0  
1000 s: (129.5...137.5)  
Spread cm3 : 3.50  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

DO1

Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 8,4 D  
Edition : 03.06.91  
Replaces : 18.02.91  
Test oil : ISO-4113

Combination no. : 0 403 476 081

Injection pump  
Pump designation : PES6MW100/720RS1196  
EP type number : 0 413 406 184  
Governor  
Governor design. : RSV350...1050MWOA338  
Governor no. : 0 420 085 138

Customer-spec. information  
Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50  
: (3.35...3.55)

Rack travel in mm : 9.00...12.00

D02

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 4.8...5.2

Del.quantity cm3/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 750

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.10

Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 4.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 425  
Rack travel in mm : 4.30...4.70

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 500  
Rack travel in m: 11.10...11.20  
3rd speed rpm : 800  
Rack travel in m: 11.10...11.20  
5th speed rpm : 400  
Rack travel in m: 12.60...12.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

#### Measurement

Speed 1/min : 550

1st pressure hPa : 200  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 750  
Rack travel in m: 11.10...11.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 500  
Del.quantity cm3/ : 125.0...128.0  
1000 s: (122.5...130.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 750  
Speed rpm : 800

Del.quantity cm3/ : 132.0...135.0  
1000 s: (129.5...137.5)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (118.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 4.80...5.20  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

#### Remarks:

:

Starting/full-load transition speed  
from holding magnet = 500 1/min.

Idle adjustment at 425 min-1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 D 5  
 Edition : 26.04.91  
 Replaces : 22.03.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 103  
 Injection pump  
 Pump designation : PES6MW100/720RS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RSV350...1200MWOA342  
 -6  
 Governor no. : 0 420 085 169

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 92.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00X1.50X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.10...10.20

Del.quantity cm3/ : 6.4...6.6

100 s: (6.2...6.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.2...6.9

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 750

Del.quantity : 64.0...66.0

1000 : (62.0...68.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 94...102

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.10  
Speed rpm : 1235...1240 \*  
2nd rack travel in: 4.00  
Speed rpm : 1270...1283  
3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1245...1265  
Speed rpm : 9.10

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.20...6.90  
Rack travel in mm : 2.00  
Speed rpm : 440...500

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 600  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 1000  
Rack travel in m: 10.40...10.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 180  
Rack travel mm : 10.50...10.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 750  
Rack travel in m: 10.90...11.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 600  
Del.quantity cm3/ : 58.0...61.0  
1000 s: (55.5...63.5)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 47.0...49.0  
1000 s: (45.0...51.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1235...1240

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.20...6.90  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 35...43 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 D 6  
Edition : 03.05.91  
Replaces : 22.03.91  
Test oil : ISO-4113

Combination no. : 0 403 476 104

Injection pump  
Pump designation : PES6MW100/72ORS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RSV350...1200MWOA342  
-7

Governer no. : 0 420 085 170

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 100.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 7.4...7.6

100 s: (7.2...7.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.5

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 750

Del.quantity : 74.0...76.0

1000 : (72.0...78.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:



1st rack travel in: 9.50  
Speed rpm : 1240...1245 \*  
2nd rack travel in: 4.00  
Speed rpm : 1280...1293  
3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1240...1255  
Speed rpm : 9.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.80...6.50  
Rack travel in mm : 2.00  
Speed rpm : 450...530

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 600  
Rack travel in m: 11.30...11.40  
3rd speed rpm : 1000  
Rack travel in m: 10.90...11.10

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 250  
Rack travel mm : 10.60...10.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 300  
Rack travel in m: 10.90...11.10  
3rd pressure hPa : 750  
Rack travel in m: 11.30...11.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 600

Del.quantity cm3/ : 67.0...70.0  
1000 s: (64.5...72.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 47.0...49.0  
1000 s: (45.0...51.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1240...1245

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.50  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

\* Read off speed set under 1.  
Add 40...48 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 D 7  
Edition : 26.04.91  
Replaces : 22.0391  
Test oil : ISO-4113

Combination no. : 0 403 476 105

Injection pump  
Pump designation : PES6MW100/72ORS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RSV350...1200MWOA342  
-8  
Governor no. : 0 420 085 171

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 114.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...6.0

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 750

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90  
Speed rpm : 1240...1245 \*  
2nd rack travel in: 4.00  
Speed rpm : 1285...1293  
3rd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1240...1255  
Speed rpm : 9.90

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.30...6.00  
Rack travel in mm : 2.00  
Speed rpm : 420...500

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 600  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 1000  
Rack travel in m: 11.00...11.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 300  
Rack travel mm : 10.70...10.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 400  
Rack travel in m: 11.30...11.50  
3rd pressure hPa : 750  
Rack travel in m: 11.70...11.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 600

Del.quantity cm3/ : 78.0...81.0  
1000 s: (75.5...83.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 47.0...49.0  
1000 s: (45.0...51.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1240...1245

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...6.00  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

:  
\* Read off speed set under 1.  
Add 45...53 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,7, B  
Edition : 26.04.91  
Replaces : 19.03.91  
Test oil : ISO-4113

Combination no. : 0 403 476 106

Injection pump  
Pump designation : PES6MW100/320RS1213  
EP type number : 0 413 406 203  
Governor  
Governor design. : RSV350...750MW7A345  
Governor no. : 0 420 085 168

Customer-spec. information  
Customer : NAVISTAR

Engine : DT-466

1st version kW : 159.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 16.2...16.4

100 s: (16.0...16.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 4.7...4.9

Del.quantity cm3/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 162.5...164.5

1000 : (160.5...166.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.20  
Speed rpm : 750...760  
2nd rack travel in: 4.00  
Speed rpm : 795...805  
3rd rack travel in: 4.00  
Speed rpm : 800...810  
4th rack travel in: 850  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.8

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 4.70...4.90

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 750...760

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...180.0  
1000 s: (155.0...185.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 8.0...12.0  
1000 s: (5.5...14.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 6,1 Q 1  
 Edition : 26.04.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 108  
 Injection pump  
 Pump designation : PES6MW100/320RS1132  
 EP type number : 0 413 406 124  
 Governor  
 Governor design. : RSV325...1400MW2A314  
 -3  
 Governor no. : 0 420 085 173

Customer-spec. information  
 Customer : PENTA

Engine : TD 610M

1st version kW : 147.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 2.00X6.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.90...3.00  
 : (2.85...3.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 6.0...6.1

Del.quantity cm3/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 900

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 54...62

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.30

Speed rpm : 1440...1450

2nd rack travel in: 4.00

Speed rpm : 1520...1540  
4th rack travel in: 1650  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 325  
Rack travel in mm : 5.50...5.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 130  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 420  
Rack travel in m: 10.90...11.20  
3rd pressure hPa : 900  
Rack travel in m: 11.30...11.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm3/ : 78.0...80.0  
1000 s: (76.0...82.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 1440...1450

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 140.0...160.0  
1000 s: (137.0...163.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.00...6.10  
Del.quantity cm3/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 8,7 Q 1  
Edition : 27.05.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 546 008  
  
Injection pump  
Pump designation : PE6MW100/720RS1177  
EP type number : 0 413 506 107  
Governor  
Governor design. : RQ300/1250MW12-2  
Governor no. : 0 420 082 020

Customer-spec. information  
Customer : MB-NFZ

Engine : OM360A

1st version kW : 147.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.80...3.90  
: (3.75...3.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.4...8.6

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 13.10...13.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 97.0...99.0

1000 : (95.0...101.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 42...50

Setting point:

Speed rpm : 650

Rack travel in mm : 13.5

Testing:

1st rack travel in: 11.90

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1415...1445

4th rack travel in: 1550



Speed rpm : 0.10...1.00

#### LOW IDLE 1

Control lever

position degrees: 13...21

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 8.5

#### Testing:

Speed rpm : 220

Minimum rack trave: 10.40

Speed rpm : 300

Rack travel in mm : 8.40...8.60

Rack travel in mm : 2.00

Speed rpm : 430...470

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750

Del.quantity cm3/ : 95.0...98.0

1000 s: (92.5...100.5)

Spread cm3 : 5.00

1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 1295...1310

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 80.0...90.0

1000 s: (77.0...93.0)

#### LOW IDLE

Speed rpm : 300

Rack travel in mm : 8.40...8.60

Del.quantity cm3/ : 10.0...14.0

1000 s: (7.5...16.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : BAO 13,2 B  
 Edition : 27.05.91  
 Replaces : 04.11.88  
 Test oil : ISO-4113  
 Combination no. : 0 403 546 018  
 Injection pump  
 Pump designation : PE6MW100/320RS1174  
 EP type number : 0 413 506 106  
 Governor  
 Governor design. : RQV325...1500MW100  
 Governor no. : 0 420 083 166

Customer-spec. information  
 Customer : BAUDOUIN

Engine : 6 F 11 SRE

1st version kW : 225.0  
 Rated speed : 3000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 3- 6- 5- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 12.9...13.1

100 s: (12.7...13.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1650

travel mm : 9.40...9.80

2nd speed rpm : 1550

travel mm : 8.50...8.70

3rd speed rpm : 600

travel mm : 2.50...3.10

4th speed rpm : 325

travel mm : 1.00...1.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Del.quantity : 129.0...131.0

1000 : (127.0...133.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 10.50

Speed rpm : 1540...1550

2nd rack travel in: 4.00  
Speed rpm : 1635...1665  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.50  
Speed rpm : 325  
Rack travel in mm : 6.90...7.10

#### START CUT-OUT

Speed 1/min : 230 (250)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1540...1550

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 105.0...115.0  
1000 s: (102.0...118.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.90...7.10  
Del.quantity cm3/ : 8.0...12.0  
1000 s: (5.5...14.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : BAO 13,2 B1  
 Edition : 17.05.91  
 Replaces : 07.02.89  
 Test oil : ISO-4113

Combination no. : 0 403 546 019

Injection pump  
 Pump designation : PE6MW100/32ORS1174  
 EP type number : 0 413 506 106  
 Governor  
 Governor design. : RQV325...1500MW101  
 Governor no. : 0 420 083 167

Customer-spec. information  
 Customer : BAUDOUIN

Engine : 6 F 11 SRE

1st version kW : 206.0  
 Rated speed : 3000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00

D18

Firing order : 1- 4- 3- 6- 5- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 7.0...7.2

Del.quantity cm3/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1650  
 travel mm : 9.40...9.80

2nd speed rpm : 1550  
 travel mm : 8.50...8.70

3rd speed rpm : 600  
 travel mm : 2.50...3.10

4th speed rpm : 325  
 travel mm : 1.00...1.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1500  
 Aneroid pressure h: 700  
 Del.quantity : 119.0...121.0  
 1000 : (117.0...123.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 52...60

Testing:  
 1st rack travel in: 10.10

Speed rpm : 1540...1550  
2nd rack travel in: 4.00  
Speed rpm : 1625...1655  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 325  
Rack travel in mm : 7.00...7.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1500  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 800  
Rack travel in m: 11.90...12.00  
3rd speed rpm : 1000  
Rack travel in m: 11.30...11.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 500  
Rack travel mm : 11.30...11.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : 700  
Rack travel in m: 11.90...12.00  
2nd pressure hPa : 600  
Rack travel in m: 11.50...11.60

#### START CUT-OUT

Speed 1/min : 230 (250)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 128.5...131.5  
1000 s: (126.0...134.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 109.0...111.0  
1000 s: (107.0...113.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1540...1550

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 105.0...115.0  
1000 s: (102.0...118.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.00...7.20  
Del.quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (5.5...14.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE 6,5 F  
Edition : 26.04.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 546 020  
Injection pump  
Pump designation : PE6MW100/720RS1157  
EP type number : 0 413 506 103  
Governor  
Governor design. : RQ250/1200MW94-2  
Governor no. : 0 420 082 047

Customer-spec. information  
Customer : SNF

Engine : WD 612.66

1st version kW : 165.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 13.1...13.3

100 s: (12.9...13.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.8...6.0

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320  
travel mm : 9.00...9.40

2nd speed rpm : 1250  
travel mm : 6.20...6.40

3rd speed rpm : 375  
travel mm : 3.30...3.90

4th speed rpm : 250  
travel mm : 1.00...1.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 800

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 900

Del.quantity : 131.0...133.0

1000 : (129.0...135.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 94...102

Setting point:  
Speed rpm : 800  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1235...1250  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.9

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION  
Speed rpm : 260...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 400  
Rack travel mm : 11.50...11.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 660  
Rack travel in m: 12.90...13.20  
3rd pressure hPa : 900  
Rack travel in m: 13.50...13.60

START CUT-OUT

Speed 1/min : 190 (210)

FUEL DELIVERY CHARACTERISTICS

1st version

D21

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 130.5...134.5  
1000 s: (128.5...136.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 79.5...81.5  
1000 s: (77.5...83.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1235...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.80...6.00  
Del.quantity cm3/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4 D  
Edition : 17.05.91  
Replaces : 02.05.90  
Test oil : ISO-4113

Combination no. : 0 403 548 037

Injection pump  
Pump designation : PE8MW100/720LS1128  
EP type number : 0 413 508 103  
Governor  
Governor design. : RQV450...1150MW70-2  
Governor no. : 0 420 083 211

Customer-spec. information  
Customer : KHD

Engine : BF 8L 513

1st version kW : 191.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20  
: (3.05...3.25)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150  
Rack travel in mm : 11.30...11.40  
Del. quantity cm<sup>3</sup>/ : 12.2...12.4  
100 s: (12.0...12.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 450.0  
Rack travel in mm : 5.6...5.8  
Del. quantity cm<sup>3</sup>/ : 1.3...1.7  
100 s: (1.0...1.9)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1200  
travel mm : 9.30...9.40  
2nd speed rpm : 1000  
travel mm : 6.20...6.40  
3rd speed rpm : 600  
travel mm : 2.50...3.10  
4th speed rpm : 450  
travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1150  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Del. quantity : 122.0...124.0  
1000 : (120.0...126.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 118...126

Setting point:  
Speed rpm : 1150  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 10.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1320  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 450  
Rack travel in mm : 5.60...5.80

#### START CUT-OUT

Speed 1/min : 350 (370)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...150.0  
1000 s: (137.0...153.0)

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 t1  
Edition : 25.06.91  
Replaces : 18.1.91  
Test oil : ISO-4113

Combination no. : 0 402 736 809

Injection pump  
Pump designation : PES6P120A720/3LS7209  
EP type number : 0 412 726 837  
Governor  
Governor design. : RQV300...1000PA960-2  
K  
Governor no. : 0 421 815 249

Customer-spec. information  
Customer : MAN

Engine : D2866LF06

1st version kW : 309.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
(4.75...4.95)  
Rack travel in mm : 15.00...16.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 28.5...28.7

100 s: (28.2...29.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.8...5.2

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
travel mm : 9.60...9.80

2nd speed rpm : 300  
travel mm : 1.40...1.80

3rd speed rpm : 500  
travel mm : 3.50...4.10

4th speed rpm : 900  
travel mm : 7.70...8.10

5th speed rpm : 1350  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1300  
Del.quantity : 285.0...287.0  
1000 : (282.0...290.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 293...301

#### Testing:

1st rack travel in: 12.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 247...255

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 320...440

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 1000  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 750  
Rack travel in m: 12.70...12.90  
4th speed rpm : 400  
Rack travel in m: 11.50...11.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1300  
Rack travel mm : 13.50...13.60

#### Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.80...9.00

2nd pressure hPa : 220  
Rack travel in m: 9.10...9.20  
3rd pressure hPa : 720  
Rack travel in m: 11.40...11.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1300  
Speed rpm : 1000  
Del.quantity cm3/ : 261.0...265.0  
1000 s: (258.0...268.0)  
Aneroid pressure h: 1300  
Speed rpm : 750  
Del.quantity cm3/ : 271.0...277.0  
1000 s: (268.0...280.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 166.0...168.0  
1000 s: (163.0...171.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 3-7052

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 e  
Edition : 17.06.91  
Replaces : 4.9.90  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 885  
  
Injection pump  
Pump designation : PES6P120A72ORS7157  
EP type number : 0 412 726 814  
Governor  
Governor design. : RQV325...875PA944-3K  
Governor no. : 0 421 815 238

Customer-spec. information  
Customer : MACK TRUCKS

Engine : EM7-275

1st version kW : 205.0  
Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve  
: 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 19.2...19.4

100 s: (19.0...19.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm3/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 192.0...194.0

1000 : (190.0...196.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 10.40  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 510  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 600  
Rack travel in m: 12.40...12.80  
4th speed rpm : 450  
Rack travel in m: 0.00...12.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 12.80...13.00

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 355  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 630  
Rack travel in m: 11.50...11.90

START CUT-OUT

D27

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 268.0...274.0  
1000 s: (266.0...276.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (136.5...157.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 157.5...161.5  
1000 s: (155.5...163.5)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 915...925

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 10.40...11.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P22

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

Bow dimension:  
Sliding-sleeve position = 37.0 mm

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 D15  
Edition : 05.07.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 436 109  
  
Injection pump  
Pump designation : PES6MW100/120RS1143  
EP type number : 0 413 406 137  
Governor  
Governor design. : RQV300...1050MW82-4  
Governor no. : 0 420 083 168

Customer-spec. information  
Customer : CUMMINS/US

Engine : 6 CTA-830

1st version kW : 175.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15  
: (3.00...3.20)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 14.8...15.0

100 s: (14.6...15.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 7.7...7.9  
Del.quantity cm3/ : 1.6...2.0  
100 s: (1.3...2.2)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1210  
travel mm : 9.00...9.40  
2nd speed rpm : 1100  
travel mm : 7.90...8.10  
3rd speed rpm : 550  
travel mm : 3.00...3.60  
4th speed rpm : 300  
travel mm : 1.10...1.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 900  
Del.quantity : 148.0...150.0  
1000 : (146.0...152.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 42...50

Testing:

1st rack travel in: 11.60  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.8

Testing:

Speed rpm : 100  
Minimum rack travel: 9.30  
Speed rpm : 300  
Rack travel in mm : 7.70...7.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.20...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : 225  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 450  
Rack travel in m: 11.90...12.30  
3rd pressure hPa : 900  
Rack travel in m: 12.60...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 145.5...148.5  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 88.5...90.5  
1000 s: (86.5...92.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 215.0...225.0  
1000 s: (212.0...228.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.70...7.90  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3915581

Start-of-delivery mark/lock = 8.0°  
angular displacement of the cam after  
start of delivery of cylinder 1.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 6,2 G 1  
Edition : 05.07.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 436 113  
Injection pump  
Pump designation : PES6MW100/320/3RS116  
2  
EP type number : 0 413 406 149  
Governor  
Governor design. : RQ300/1000MW117  
Governor no. : 0 420 082 057

Customer-spec. information  
Customer : MWM

Engine : TBD226B-6

1st version kW : 150.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
: (3.95...4.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1100

travel mm : 7.30...7.70

2nd speed rpm : 1000

travel mm : 5.90...6.10

3rd speed rpm : 370

travel mm : 4.70...5.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 144.0...146.0

1000 : (142.0...148.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 91...99

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1040...1055  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 28...36  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.70...8.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.50...9.70  
2nd pressure hPa : 650  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1200  
Rack travel in m: 12.40...12.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 143.5...146.5  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 64.0...66.0  
1000 s: (62.0...68.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1040...1055

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...150.0  
1000 s: (137.0...153.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 V  
Edition : 21.06.91  
Replaces : 05.11.90  
Test oil : ISO-4113

Combination no. : 0 403 446 230

Injection pump  
Pump designation : PES6MW100/320RS1185  
EP type number : 0 413 406 170  
Governor  
Governor design. : RQV350...1200MW64-2  
Governor no. : 0 420 083 194

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 201.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85  
: (3.70...3.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 14.2...14.4

100 s: (14.0...14.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 6.0...6.2  
Del.quantity cm3/ : 1.4...1.8  
100 s: (1.1...2.0)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 8.30...8.50  
2nd speed rpm : 1460  
travel mm : 9.10...9.50  
3rd speed rpm : 550  
travel mm : 3.10...3.70  
4th speed rpm : 350  
travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 800  
Del.quantity : 142.5...144.5  
1000 : (140.5...146.5)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 42...50

### Testing:

1st rack travel in: 13.00  
Speed rpm : 1265...1285  
2nd rack travel in: 4.00  
Speed rpm : 1415...1425  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control Lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

### Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

### CONSTANT REGULATION

Speed rpm : 360...450

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 800  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 1150  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 265  
Rack travel mm : 11.50...11.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.20  
2nd pressure hPa : 480  
Rack travel in m: 13.30...13.60  
3rd pressure hPa : 800  
Rack travel in m: 14.40...14.60

### START CUT-OUT

Speed 1/min : 280 (290)

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 800  
Speed rpm : 800  
Del.quantity cm3/ : 151.0...155.0  
1000 s: (149.0...157.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 83.5...85.5  
1000 s: (81.5...87.5)

### BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1265...1285

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 19.00...21.00

### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

### Remarks:

: IHC #1815225C91

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than  $n = 500$  1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 8,1 D  
Edition : 21.06.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 249

Injection pump  
Pump designation : PES6MW100/720RS1197  
EP type number : 0 413 406 185  
Governor  
Governor design. : RQV325...1350MW109K  
Governor no. : 0 420 083 997

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 8060.45.6700

1st version kW : 165.0  
Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
: (3.95...4.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 10.0...10.2

100 s: (9.8...10.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0  
Rack travel in mm : 7.7...7.9  
Del.quantity cm3/ : 2.5...2.9  
100 s: (2.2...3.1)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1400  
travel mm : 10.00...10.40  
2nd speed rpm : 825  
travel mm : 4.90...5.10  
3rd speed rpm : 400  
travel mm : 2.90...3.50  
4th speed rpm : 325  
travel mm : 1.50...1.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1350  
Aneroid pressure h: 850  
Del.quantity : 100.0...102.0  
1000 : (98.0...104.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 13.00  
Speed rpm : 1410...1420  
2nd rack travel in: 4.00  
Speed rpm : 1495...1525  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.8

Testing:

Speed rpm : 200  
Minimum rack travel: 10.00  
Speed rpm : 325  
Rack travel in mm : 7.70...7.90

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1350  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1200  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 1000  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 13.30...13.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.30...11.40

Measurement

Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 11.70...11.80  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.10  
3rd pressure hPa : 850  
Rack travel in m: 13.30...13.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 850  
Speed rpm : 1200

Del.quantity cm3/ : 102.5...105.5  
1000 s: (100.0...108.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 850  
Speed rpm : 1000  
Del.quantity cm3/ : 101.5...104.5  
1000 s: (99.0...107.0)  
Aneroid pressure h: 850  
Speed rpm : 600  
Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.5...79.5  
1000 s: (75.5...81.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1410...1420

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 65.0...85.0  
1000 s: (62.0...88.0)

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.70...7.90  
Del.quantity cm3/ : 25.0...29.0  
1000 s: (22.5...31.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 W  
Edition : 21.06.91  
Replaces : 20.07.90  
Test oil : ISO-4113

Combination no. : 0 403 456 109

Injection pump  
Pump designation : PES6MW100/321RS1200  
EP type number : 0 413 406 189  
Governor  
Governor design. : RQV250...1200MW83-2  
Governor no. : 0 420 083 216

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

E09

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
travel mm : 10.50...10.60

2nd speed rpm : 810  
travel mm : 5.90...6.10

3rd speed rpm : 500  
travel mm : 3.70...4.30

4th speed rpm : 250  
travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 120...128

Testing:

1st rack travel in: 11.50  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 77...85  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 330...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 170  
Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.50...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 135.0...138.0  
1000 s: (132.5...140.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 138.0...141.0  
1000 s: (135.5...143.5)  
Aneroid pressure h: 1000  
Speed rpm : 1200

Del.quantity cm3/ : 136.0...139.0  
1000 s: (133.5...141.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...100.0  
1000 s: (77.0...103.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: MAN 3-7036

Start-of-delivery mark is at start of  
delivery of cylinder 1



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 V  
Edition : 28.06.91  
Replaces : 20.07.90  
Test oil : ISO-4113

Combination no. : 0 403 456 110

Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-3  
Governor no. : 0 420 082 043

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 8.40...8.80

2nd speed rpm : 1260

travel mm : 6.60...6.80

3rd speed rpm : 345

travel mm : 4.00...4.60

4th speed rpm : 250

travel mm : 1.80...2.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 600

Rack travel in mm : 18.20...19.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 92...100

Setting point:

Speed rpm : 600

Rack travel in mm : 19.0

Testing:

1st rack travel in: 11.30

Speed rpm : 1245...1260

2nd rack travel in: 4.00

Speed rpm : 1300...1330

4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 69...77

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.5

Testing:

Speed rpm : 100

Minimum rack travel: 7.00

Speed rpm : 250

Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 12.50...12.60

2nd speed rpm : 600

Rack travel in m: 12.70...12.90

3rd speed rpm : 800

Rack travel in m: 12.70...12.90

4th speed rpm : 1200

Rack travel in m: 12.20...12.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 170

Rack travel mm : 10.20...10.30

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.00...10.10

2nd pressure hPa : 550

Rack travel in m: 11.90...12.20

3rd pressure hPa : 1000

Rack travel in m: 12.70...12.90

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 600

Del.quantity cm3/ : 137.0...140.0

1000 s: (134.5...142.5)

Spread cm3 : 5.00

1000 s: (7.0)

Aneroid pressure h: 1000

Speed rpm : 800

Del.quantity cm3/ : 140.0...143.0

1000 s: (137.5...145.5)

Aneroid pressure h: 1000

Speed rpm : 1200

Del.quantity cm3/ : 134.5...137.5

1000 s: (132.0...140.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 74.0...76.0

1000 s: (72.0...78.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 60.0...80.0

1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.40...5.60

Del.quantity cm3/ : 16.0...20.0

1000 s: (13.5...22.5)

Spread cm3 : 5.00

1000 s: (7.00)

Remarks:

: MAN #3-7047

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 V 1  
Edition : 28.06.91  
Replaces : 18.02.91  
Test oil : ISO-4113

Combination no. : 0 403 456 114

Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQV250...1200MW83-2  
Governor no. : 0 420 083 216

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
travel mm : 10.50...10.60

2nd speed rpm : 810  
travel mm : 5.90...6.10

3rd speed rpm : 500  
travel mm : 3.70...4.30

4th speed rpm : 250  
travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 120...128

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 330...420

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 800  
Rack travel in m: 12.70...12.90  
4th speed rpm : 1200  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 170  
Rack travel mm : 10.20...10.30

Measurement  
Speed 1/min : 500  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.70...12.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600

Del.quantity cm3/ : 137.0...140.0  
1000 s: (134.5...142.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 140.0...143.0  
1000 s: (137.5...145.5)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 134.5...137.5  
1000 s: (132.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7135  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 D 2  
Edition : 21.06.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 117  
  
Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQV250...1200MW83-2  
Governor no. : 0 420 083 216

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF 04

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/ : 16.3...16.5

100 s: (16.1...16.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 6.2...6.4

Del.quantity cm3/ : 2.1...2.5

100 s: (1.8...2.7)

Spread cm3 : 0.3

100 s: (0.5)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (161.0...167.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 94...102

Testing:

1st rack travel in: 12.60

Speed rpm : 1250...1260

2nd rack travel in: 4.00

Speed rpm : 1320...1350

4th rack travel in: 1400

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 32...40

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 6.3

Testing:

Speed rpm : 150  
Minimum rack travel: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 750  
Rack travel in m: 12.60...12.90  
3rd pressure hPa : 1200  
Rack travel in m: 13.60...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 167.0...170.0  
1000 s: (164.5...172.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 163.0...166.0  
1000 s: (160.5...168.5)  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 160.0...163.0  
1000 s: (157.5...165.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (75.0...81.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 70.0...90.0  
1000 s: (67.0...93.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del.quantity cm<sup>3</sup>/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: MAN 3-7138

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 6,2 F  
Edition : 21.06.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 466 125

Injection pump  
Pump designation : PES6MW100/320/3RS116  
2-1

EP type number : 0 413 406 196  
Governor  
Governor design. : RSV325...900MW1A340  
Governor no. : 0 420 085 144

Customer-spec. information  
Customer : MWM

Engine : TD 226 B-6  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
(3.95...4.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 11.6...11.8

100 s: (11.4...12.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 116.5...118.5

1000 : (114.5...120.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.40

Speed rpm : 940...950

2nd rack travel in: 4.00

Speed rpm : 980...1010  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 325  
Rack travel in mm : 6.50...6.70

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0  
1000 s: (97.0...123.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.50...6.70  
Del.quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (5.5...14.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 T  
 Edition : 05.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 466 126  
 Injection pump  
 Pump designation : PES6MW100/12ORS1218  
 EP type number : 0 413 406 208  
 Governor  
 Governor design. : RSV400...1050MW7A319  
 -17  
 Governor no. : 0 420 085 174

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CTA

1st version kW : 261.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.15...3.25  
 : (3.10...3.30)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 15.30...15.40

Del.quantity cm3/ : 20.7...20.9

100 s: (20.5...21.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 7.2...7.4

Del.quantity cm3/ : 1.7...2.1

100 s: (1.5...2.4)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 207.0...209.0

1000 : (205.0...211.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 108...116

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 14.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
3rd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 6.70...6.90

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.30  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.20...7.40  
Del.quantity cm<sup>3</sup>/ : 17.5...21.5  
1000 s: (15.0...24.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3919723

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 4,1 H 2  
Edition : 21.06.91  
Replaces : 19.03.91  
Test oil : ISO-4113

Combination no. : 0 403 474 014

Injection pump  
Pump designation : PES4MW100/720RS1187  
EP type number : 0 413 404 108  
Governor  
Governor design. : RS300/1250MWOA344  
Governor no. : 0 420 084 002

Customer-spec. information  
Customer : KHD

Engine : BF 4L 913C

1st version kW : 92.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.95...4.05  
: (3.90...4.10)

Rack travel in mm : 9.00...12.00

E21

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.90...12.00

Del.quantity cm<sup>3</sup>/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1000

Del.quantity : 118.0...120.0

1000 : (116.0...122.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.00

Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1385...1415  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3  
Speed rpm : 300  
Rack travel in mm : 7.20...7.40

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 11.90...12.00  
2nd speed rpm : 800  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 900  
Rack travel in m: 12.10...12.30  
4th speed rpm : 1000  
Rack travel in m: 12.00...12.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : 320  
Rack travel in m: 10.80...11.00  
2nd pressure hPa : 470  
Rack travel in m: 11.70...11.90  
3rd pressure hPa : 1000  
Rack travel in m: 12.40...12.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 113.5...116.5  
1000 s: (111.0...119.0)  
Spread cm3 : 3.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 66.0...68.0  
1000 s: (64.0...70.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Del.quantity cm3/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 6,1 R  
Edition : 24.04.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 476 102

Injection pump  
Pump designation : PES6MW100/320RS1211  
EP type number : 0 413 406 202  
Governor  
Governor design. : RSV650...750MW4A311-  
5  
Governor no. : 0 420 085 166

Customer-spec. information  
Customer : PENTA

Engine : TID 61 AG

1st version kW : 115.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.90...3.00  
: (2.85...3.05)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 650.0

Rack travel in mm : 5.0...5.5

Del.quantity cm3/ : 1.7...2.1

100 s: (1.5...2.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 124.0...126.0

1000 : (122.0...128.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 84...92

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.20

Speed rpm : 748...753  
2nd rack travel in: 4.00  
Speed rpm : 773...788  
3rd rack travel in: 4.00 \*  
Speed rpm : 795...810  
4th rack travel in: 1000  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control Lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 650  
Rack travel in mm : 4.2

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 650  
Rack travel in mm : 4.00...4.50

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 748...753

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (137.0...163.0)

#### LOW IDLE

Speed rpm : 650  
Rack travel in mm : 5.00...5.50  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (15.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 6,1 Q 1  
Edition : 28.06.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 476 108  
Injection pump  
Pump designation : PES6MW100/32ORS1132  
EP type number : 0 413 406 124  
Governor  
Governor design. : RSV325...1400MW2A314  
-3  
Governor no. : 0 420 085 173

Customer-spec. information  
Customer : PENTA

Engine : TD 610M

1st version kW : 147.0  
Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 2.00X6.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.90...3.00  
: (2.85...3.05)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 900

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 104...112

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.30  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1520...1540  
3rd rack travel in: 4.00  
Speed rpm : 1540...1570  
4th rack travel in: 1650  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 325  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 540...600

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 130  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 420  
Rack travel in m: 11.00...11.30  
3rd pressure hPa : 900  
Rack travel in m: 11.30...11.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm3/ : 78.0...80.0  
1000 s: (76.0...82.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.30

Speed rpm : 1440...1450

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4 F  
Edition : 21.06.91  
Replaces : 28.11.88  
Test oil : ISO-4113

Combination no. : 0 403 548 027

Injection pump  
Pump designation : PE8MW100/720LS1173  
EP type number : 0 413 508 108  
Governor  
Governor design. : RQV300...1150MW99  
Governor no. : 0 420 083 163

Customer-spec. information  
Customer : KHD

Engine : F8L513

1st version kW : 188.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20  
: (3.05...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 5.0...5.2  
Del.quantity cm3/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1280  
travel mm : 11.10...11.50  
2nd speed rpm : 1190  
travel mm : 10.10...10.30  
3rd speed rpm : 400  
travel mm : 2.90...3.50  
4th speed rpm : 300  
travel mm : 2.20...2.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1200  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Del.quantity : 115.0...117.0  
1000 : (113.0...119.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 45...53

Testing:

1st rack travel in: 11.00  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1370  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.1

Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.00...5.20

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 650  
Rack travel in m: 12.30...12.40  
3rd speed rpm : 1000  
Rack travel in m: 12.20...12.30

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 113.5...116.5  
1000 s: (111.0...119.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (132.0...158.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4 F1  
 Edition : 21.06.91  
 Replaces : 07.02.89  
 Test oil : ISO-4113  
 Combination no. : 0 403 548 032  
 Injection pump  
 Pump designation : PE8MW100/720LS1173  
 EP type number : 0 413 508 108  
 Governor  
 Governor design. : RQ300/1150MW61-2  
 Governor no. : 0 420 082 036

Customer-spec. information  
 Customer : KHD

Engine : F8L513

1st version kW : 188.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20  
 : (3.05...3.25)  
 Rack travel in mm : 9.00...12.00

F01

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm3/ : 11.5...11.7  
 100 s: (11.3...11.9)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm3/ : 1.1...1.5  
 100 s: (0.8...1.7)  
 Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1270  
 travel mm : 8.50...9.00  
 2nd speed rpm : 1210  
 travel mm : 6.60...6.80  
 3rd speed rpm : 420  
 travel mm : 3.50...4.10  
 4th speed rpm : 300  
 travel mm : 1.50...1.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: 107  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del.quantity : 115.0...117.0  
 1000 : (113.0...119.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 26...34

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.00  
Speed rpm : 1190...1205  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 650  
Rack travel in m: 12.30...12.40  
3rd speed rpm : 1000  
Rack travel in m: 12.20...12.30

#### START CUT-OUT

Speed 1/min : 220 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm3/ : 113.5...116.5  
1000 s: (111.0...119.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 1190...1205

F02

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (132.0...158.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4D18  
 Edition : 28.06.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 548 038  
 Injection pump  
 Pump designation : PE8MW100/720LS1128  
 EP type number : 0 413 508 103  
 Governor  
 Governor design. : RQ300/1200MW71-1  
 Governor no. : 0 420 082 060

Customer-spec. information  
 Customer : KHD

Engine : BF8L513

1st version kW : 172.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20  
 : (3.05...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 10.7...10.9

100 s: (10.5...11.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1150

travel mm : 6.40...6.60

2nd speed rpm : 1200

travel mm : 9.50...10.40

3rd speed rpm : 800

travel mm : 5.80...6.20

4th speed rpm : 300

travel mm : 1.70...2.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 107.0...109.0

1000 : (105.0...111.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 27...35

Setting point:  
Speed rpm : 650  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 10.90  
Speed rpm : 1240...1155  
2nd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

START CUT-OUT

Speed 1/min : 220 (250)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 1240...1155

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (132.0...158.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

FD4

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 5,9 h  
Edition : 24.06.91  
Replaces : 21.5.87  
Test oil : ISO-4113

Combination no. : 9 400 085 270

Injection pump  
Pump designation : PES6A90D320RS2718  
EP type number : 9 400 084 003  
Governor  
Governor design. : RSV350...1400A2B2215  
-1R  
Governor no. : 9 420 083 231

Customer-spec. information  
Customer : MWM

Engine : D229/6

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 046

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 8.50...8.60

Del.quantity cm3/ : 6.1...6.2

100 s: (5.9...6.4)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 350

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1400

Del.quantity : 61.5...62.5

1000 : (59.5...64.5)

Spread cm3 : 3.00

1000 : (5.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 55...63

Testing:

1st rack travel in: 7.50  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1650  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 21...29

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.00

Speed rpm : 350

Rack travel in mm : 5.40...5.60

Rack travel in mm : 2.00

Speed rpm : 560...620

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1400

Rack travel in m: 8.50...8.60

2nd speed rpm : 500

Rack travel in m: 9.10...9.20

4th speed rpm : 900

Rack travel in m: 8.80...9.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500

Del.quantity cm3/ : 56.0...58.0

1000 s: (53.5...60.5)

Speed rpm : 900

Del.quantity cm3/ : 64.0...66.0

1000 s: (61.5...68.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 7.50

Speed rpm : 1440...1450

#### STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350

F06

Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm3 : 2.50  
1000 s: (4.50)

Remarks:

:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,5 R10  
Edition : 16.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1900R393  
Type number : 0 460 414 078  
Customer Part-No. :

Customer-specific information  
Customer : SOFIM

Engine : 8140.47.2700

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0,5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80  
Shutoff  
electromagnet Volt: 12

F07

## Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 5.20...5.80  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1800  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 60.50...61.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 24.50...25.50  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 11.00...15.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

## Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 40.00...46.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

## Load-dependent start of delivery: Inj.-qty.dif.measurement:

Speed 1/min: 1100  
Charge press hPa: 1000

Inj.-qty. cm<sup>3</sup>/  
 difference 1000S.: -21.70...23.70  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1100  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: -0.70...0.90  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1100  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: -0,10...0.30  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 1.40...1.80  
 mm: (0.90...2.30)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1900  
 Charge press. hPa: 1000  
 TD travel mm: 5.40...6.20  
 mm: (5.40...6.20)

Shutoff  
 electromagnet Volt: 12  
 6th speed 1/min: 1500  
 Charge press. hPa: 1000  
 TD travel mm: 3.20...4.00  
 mm: (2.90...4.30)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 5.20...5.80  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.60...8.20  
 Shutoff  
 electromagnet Volt: 12

4th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.50...7.10  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 550  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
 Charge-air pressure-setting  
 point hPa: 500  
 LDA-stroke mm: 6,0  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 49.00...50.00  
 1000S.: (45.50...53.50)

2nd speed 1/min: 2300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
 1000S.: (0.00...5.00)

3rd speed 1/min: 2200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 19.00...27.00  
 1000S.: (17.00...29.00)

5th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...46.00  
 1000S.: (38.50...47.50)

9th speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.00...63.00  
 1000S.: (57.00...64.00)

12th speed 1/min: 1800  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 60.50...61.50  
     1000S.: (57.50...64.50)  
 15th speed 1/min: 1400  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 56.00...61.00  
     1000S.: (54.50...62.50)  
 17th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm3/: 55.00...60.00  
     1000H.: (53.50...61.50)  
 18th speed 1/min: 550  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 24.50...25.50  
     1000S.: (21.50...28.50)  
 20th speed 1/min: 550  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 58.50...67.50  
     1000S.: (57.50...68.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
 Del. quantity cm3/: 0.00...3.00  
     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 11.00...15.00  
     1000S.: (9.00...17.00)

Dispersion cm3/: 6.0  
     1000S.: (6.5)

2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...5.00  
     1000S.: (0.00...5.00)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

2nd speed 1/min: 1100  
 Charge press. hPa: 1000

Inj.-qty. cm3/: 21.70...23.70  
 difference 1000S.: -

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Inj.-qty. cm3/: 25.50...33.50  
 difference 1000S.: -

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Inj.-qty. cm3/: 2.00...8.00  
 difference 1000S.: -

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 TD-travel : 0.70...0.90  
 difference mm: -

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1100  
 Charge press. hPa: 1000  
 TD-travel : 0.40...1.20  
 difference mm: -

2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply pump-  
 pressure : 0.10...0.30  
 difference bar: -

Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...80.00  
     1000S.: (40.00...80.00)

2nd speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...40.00  
     1000S.: (10.00...40.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...70.00  
     1000S.: (40.00...70.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3,2...3,4
KF	mm: K-OT
MS	mm: 0,8...1,2
SVS max.	mm: 3,0
LDA stroke	mm: 6,0
XK	mm: 20,0...22,0
XL	mm: 13,1...16,5

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 5,6 P10  
Edition : 16.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/11F1350R55-12  
Type number : 0 460 416 066  
Customer Part-No. :

Customer-specific information  
Customer : MAN

Engine : D 0226 MF/125

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,55  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Setting value mm: 5.80...6.20  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 1000

F11

Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 63.50...64.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (4.0)

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 7.00...13.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 3.0  
1000S.: (3.5)

## Full-load speed regulation

Speed 1/min: 1400  
Del. quantity cm3/  
1000S.: 45.00...51.00

Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 50.00...70.00  
mind 1000S.: 50.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1350  
TD travel mm: 8.00...8.80  
mm: (7.70...9.10)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
TD travel mm: 5.80...6.20  
mm: (5.30...6.70)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 600  
TD travel mm: 2.80...3.60  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 24

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 3.70...4.30  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1000  
Supply-pump pressure bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1350  
Supply-pump pressure bar: 6.20...6.80  
Shutoff  
electromagnet Volt: 24

### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)  
2nd speed 1/min: 1350  
Shutoff  
electromagnet Volt: 24  
Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...154.00)

### Delivery-quant. and breakaway char.:

2nd speed 1/min: 1475  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...15.00  
(0.00...15.00)  
3rd speed 1/min: 1550  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)  
5th speed 1/min: 1400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 45.00...51.00  
(43.50...52.50)  
8th speed 1/min: 1425  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 15.00...45.00  
(15.00...45.00)  
9th speed 1/min: 1350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 68.50...71.50  
(67.00...73.00)

11th speed 1/min: 700  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 49.50...53.50  
(48.00...55.00)  
12th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 63.50...64.50  
(61.50...66.50)  
20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 40.00...44.00  
(38.50...45.50)

### Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)  
Shutoff  
electromagnet volt: 24

### Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)  
Shutoff  
electromagnet volt: -

### Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 7.00...13.00  
(5.00...15.00)  
Dispersion cm<sup>3</sup>/1000S.: 3.0  
(3.5)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

### Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 47.00...63.00  
(47.00...63.00)  
2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 38.00...50.00  
1000S.: (38.00...50.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 50.00...70.00  
1000S.: (50.00...70.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5,6...6,0
MS	mm: 1,1...1,5
SVS max.	mm: 2,3
XK	mm: 17.0...19.0
XL	mm: 10.9...14.3

Remarks:

: MAN NR. 7941  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D7  
Edition : 16.07.91  
replaces : 11.86  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1250R230  
Type number : 0 460 424 026  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BT- 390 AUTOM.

Power KW: 77  
Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,66  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 4.70...5.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 69.50...70.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 36.50...37.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1500  
Charge press hPa: 1000



Del. quantity cm<sup>3</sup>/  
1000S.: 54.00...60.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...120.00  
mind 1000S.: 40.00

KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1400  
Charge press hPa: 1000  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: (1.30...2.70)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 0.40...1.00  
mm: (0.00...1.40)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2.10...2.70

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 4.70...5.30

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

4th speed 1/min: 1400

Charge press. hPa: 1000

Supply-pump  
pressure bar: 5.90...6.50  
bar: (5.70...6.70)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1400  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 6.0

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 67.00...68.00  
1000S.: (63.50...71.50)

2nd speed 1/min: 1650  
Charge press. hPa: 1000

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1500  
Charge press. hPa: 1000

KSB/AFB  
valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 54.00...60.00  
                     1000S.: (51.00...63.00)  
 6th speed 1/min: 1590  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
                     1000S.: (15.00...55.00)  
 9th speed 1/min: 1400  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 64.50...67.50  
                     1000S.: (63.00...69.00)  
 12th speed 1/min: 900  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 69.50...70.50  
                     1000S.: (67.00...73.00)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.50...37.50  
                     1000S.: (33.00...41.00)

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 1400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12  
 KSB/AFB  
 valve Volt: 12

Electr. shutoff:

1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 8.00...14.00  
                     1000S.: (6.00...16.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
                     1000S.: (7.0)  
 2nd speed 1/min: 600  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
                     1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 150  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...120.00  
                     1000S.: (40.00...120.00)

2nd speed 1/min: 380  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...40.00  
                     1000S.: (0.00...40.00)

4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...120.00  
                     1000S.: (40.00...120.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation	
K	mm: -
KF	mm: 5,0...5,4
MS	mm: 0,9...1,2
SVS max.	mm: 2,7
LDA stroke	mm: 6.0
XK	mm: 18.8...20.8
XL	mm: 9.8...13.2

Remarks:

: C.D.C. # 390 8182  
:

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D  
Edition : 16.07.91  
replaces : 11.86  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1250R230-1  
Type number : 0 460 424 027  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BT- 390 AUTOM.

Power KW: 77  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,66  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 4,70...5.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 69.50...70.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 36.50...37.50

KSB/AFB 11  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 340  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1330  
Charge press hPa: 1000

Del. quantity cm<sup>3</sup>/1000S.: 54.00...60.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/1000S.: 40.00...120.00  
mind 1000S.: 40.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1200  
Charge press hPa: 1000  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: (1.30...2.70)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
TD travel mm: 0.00...6.40  
mm: (0.00...1.00)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2.10...2.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.70...5.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.40...6.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 6.0  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000S.: 67.00...68.00  
1000S.: (63.50...71.50)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 1330

Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 54.00...60.00  
 1000S.: (51.00...63.00)  
 6th speed 1/min: 1430  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
 1000S.: (15.00...55.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 64.50...67.50  
 1000S.: (63.00...69.00)  
 12th speed 1/min: 900  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 69.50...70.50  
 1000S.: (67.00...73.00)  
 18th speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.50...37.50  
 1000S.: (33.00...41.00)

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12  
 KSB/AFB  
 valve Volt: 12

Electr. shutoff:

1st speed 1/min: 340  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 340  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 8.00...14.00  
 1000S.: (6.00...16.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)  
 2nd speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 150  
 KSB/AFB  
 valve Volt: 12  
 Timing valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...120.00  
 1000S.: (40.00...120.00)

2nd speed 1/min: 380  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...40.00  
 1000S.: (0.00...40.00)

4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...120.00  
 1000S.: (40.00...120.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: -  
 KF mm: 5,0...5,4  
 MS mm: 0,9...1,1  
 SVS max. mm: 2,7  
 LDA stroke mm: 6,0  
 XK mm: 18,8...20,8  
 XL mm: 8,4...11,8

Remarks:

: C.D.C. # 390 8191

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D2  
Edition : 16.07.91  
replaces : 11.12.86  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1250R231  
Type number : 0 460 424 028  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BTA 3.9 AUTO

Power KW: 88  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,55  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 850  
Charge press hPa: 1000  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 85.50...86.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 63.50...64.50

Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 365  
Del. quantity cm3/  
1000S.: 8.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1310  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 61.00...67.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...140.00  
mind 1000S.: 70.00



Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 4.90...5.70  
mm: (4.60...6.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 4.00...4.40  
mm: (3.50...4.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 1.80...2.60  
mm: (1.50...2.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.00...4.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.60...6.20

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.70...7.30  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 6,6  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.50...80.50  
1000S.: (76.00...84.00)

2nd speed 1/min: 1420  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000S.: (0.00...15.00)

4th speed 1/min: 1360  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1310  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.00...67.00  
1000S.: (58.00...70.00)

9th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.50...78.50  
1000S.: (74.00...80.00)

10th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 77.50...80.50  
1000S.: (75.50...82.50)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.50...86.50  
1000S.: (83.00...89.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (60.00...68.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 365  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 365  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...140.00  
1000S.: (70.00...140.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...140.00  
1000S.: (70.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5,0...5,4
MS	mm: 1,0...1,4
SVS max.	mm: 2,6
LDA stroke	mm: 6,6
XK	mm: 20,2...22,2
XL	mm: 13,1...16,6

Remarks:

: C.D.C. # 390 8195

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 C  
Edition : 16.07.91  
replaces : 11.86  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1150R231-1  
Type number : 0 460 424 029  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BTA 3.9 IND.

Power KW: 82  
Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,55  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

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## Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 850  
Charge press hPa: 1000  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 85.50...86.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 63.50...64.50

Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1220  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 62.50...68.50

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...130.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1150  
Charge press hPa: 1000  
TD travel mm: 5.20...6.00  
mm: (4.90...6.30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 4.00...4.40  
mm: (3.50...4.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 1.80...2.60  
mm: (1.50...2.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.00...4.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.60...6.20

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1150  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.90...7.50

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1150  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 6,6  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.50...80.50  
1000S.: (76.00...84.00)

2nd speed 1/min: 1320  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

4th speed 1/min: 1260  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1220  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 62.50...68.50  
1000S.: (59.50...71.50)

9th speed 1/min: 1150  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 76.00...79.00  
1000S.: (74.50...80.50)

10th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.50...82.50  
1000S.: (77.50...84.50)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.50...86.50  
1000S.: (83.00...89.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (60.00...68.00)

Mech. shutoff:  
Mech. Abst. ellung:

1st speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...130.00  
1000S.: (60.00...130.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...130.00  
1000S.: (60.00...130.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,1...5,3

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MS mm: 1,1..1,35  
SVS max. mm: 2,6  
LDA stroke mm: 6,6  
XK mm: 18,8...20,8  
XL mm: 12,4...15,8

Remarks:

: C.D.C. # 390 9590

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D1  
Edition : 16.07.91  
replaces : 11.12.86  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1050R230-3  
Type number : 0 460 424 033  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BTA-390 IND

Power KW: 79  
Speed 1/min: 2100

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000

Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 5.00...5.60  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 83.00...84.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1100  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 59.00...65.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1050  
 Charge press hPa: 1000  
 TD travel mm: 4.70...5.50  
 mm: (4.40...5.80)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 750  
 Charge press hPa: 1000  
 TD travel mm: 3.40...3.80  
 mm: (2.90...4.30)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 Charge press hPa: 1000  
 TD travel mm: 1.70...2.50  
 mm: (1.40...2.80)

Shutoff  
 electromagnet Volt: 12  
 TD travel mm: 0.00...6.40  
 mm: (0.00...1.00)

# Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.90...4.50

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 750  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5.00...5.60

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1050  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.30...6.90

Shutoff  
 electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 1050  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
 Charge-air pressure-setting point hPa: 350  
 LDA-stroke mm: 6,8  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 79.50...80.50  
 1000S.: (76.00...84.00)

2nd speed 1/min: 1120  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 20.00...50.00  
 1000S.: (20.00...50.00)

4th speed 1/min: 1180  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 59.00...65.00  
 1000S.: (56.00...68.00)

9th speed 1/min: 1050  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 76.50...79.50  
 1000S.: (75.00...81.00)

12th speed 1/min: 900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm3/: 83.00...84.00  
 1000S.: (80.50...86.50)

18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 63.50...64.50  
 1000S.: (60.00...68.00)

# Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1050  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12

# Electr. shutoff:

1st speed 1/min: 375

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

2nd speed 1/min: 230

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 10.00...50.00  
1000S.: (10.00...50.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5,1...5,4

MS mm: 1,1...1,35

SVS max. mm: 2,2

XK mm: 20.2...22.2

XL mm: 11.9...15.3

Remarks:

: C.D.C. # 390 9592

:

Operate control lever after each

G02

manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 4,0 B  
Edition : 16.07.91  
replaces : 08.11.88  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1400R279  
Type number : 0 460 424 036  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : NA 4.40 LKW

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 950  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 950  
Setting value bar: 5.40...6.00  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 800  
Del. quantity cm3/  
1000S.: 75.50...76.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (3.5)

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 19.50...23.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

## Full-load speed regulation

Speed 1/min: 1600  
Del. quantity cm3/  
1000S.: 17.00...23.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 90.00...120.00  
mind 1000S.: 90.00  
Shutoff  
electromagnet Volt: 12

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1400  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 950  
TD travel mm: 2.30...2.70  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800

TD travel mm: 0.50...1.10  
 mm: (0.10...1.50)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 800  
 Supply-pump pressure bar: 4.80...5.40  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 950  
 Supply-pump pressure bar: 5.40...6.00  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Supply-pump pressure bar: 7.20...7.80  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 Supply-pump pressure bar: 3.40...4.00  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
 (26.70...98.40)  
 2nd speed 1/min: 1400  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
 (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 3rd speed 1/min: 1660  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 0.00...3.00  
 1000S.: (0.00...3.00)  
 5th speed 1/min: 1600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 17.00...23.00  
 1000S.: (15.00...26.00)  
 8th speed 1/min: 1500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 53.00...61.00  
 1000S.: (52.00...62.00)  
 9th speed 1/min: 1400

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Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 69.00...72.00  
 1000S.: (67.50...73.50)  
 11th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 74.80...77.20  
 1000S.: (73.00...79.00)  
 12th speed 1/min: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 75.50...76.50  
 1000S.: (73.00...79.00)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 65.50...68.50  
 1000S.: (64.00...70.00)  
 Mech. shutoff:  
 Mech. Abstimmung:  
 1st speed 1/min: 1400  
 Del. quantity cm<sup>3</sup>: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12  
 Electr. shutoff:  
 1st speed 1/min: 300  
 Del. quantity cm<sup>3</sup>: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Idle delivery:  
 1st speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 19.50...23.50  
 1000S.: (16.50...26.50)  
 Dispersion cm<sup>3</sup>: 3.5  
 1000S.: (3.5)  
 2nd speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 14.50...20.50  
 1000S.: (12.50...22.50)  
 4th speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 5.00...12.00  
 1000S.: (4.50...12.50)  
 Automatic starting fuel delivery:  
 1st speed 1/min: 150

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 100.00...130.00  
1000S.: (100.00...130.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: (35.00...65.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...120.00  
1000S.: (90.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: K-OT  
MS mm: 1,1...1,5  
XK mm: 17,0...19,0  
XL mm: 9,6...13,0

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 3,9 M3  
Edition : 16.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1100R310  
Type number : 0 460 424 042  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4BT-3.9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 2.10...2.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 72.00...73.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/ 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 45.50...46.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 8.50...14.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/ 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1170  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/ 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 2.80...3.60  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 2.10...2.50  
mm: (1.60...3.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
Charge press hPa: 1000  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.10...3.70

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.20...4.80

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.80...6.40

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 325  
LDA-stroke mm: 6,5  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 68.50...69.50  
1000S.: (65.00...73.00)

2nd speed 1/min: 1280  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1230  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 0.00...15.00  
1000S.: (0.00...15.00)

4th speed 1/min: 1180  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1170  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 47.00...53.00  
1000S.: (44.00...56.00)

9th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 62.00...65.00  
1000S.: (60.50...66.50)

10th speed 1/min: 900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 63.50...68.50  
1000S.: (62.00...70.00)

12th speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 72.00...73.00  
1000S.: (69.50...75.50)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 45.50...46.50  
1000S.: (42.00...50.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.50...14.50  
1000S.: (6.50...16.50)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

3rd speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...38.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.00...115.00  
1000S.: (55.00...115.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...65.00  
1000S.: (15.00...65.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5,0...5,4
MS	mm: 1,2...1,6
SVS max.	mm: 2,5
XK	mm: 18,8...20,8
XL	mm: 11,7...15,1

Remarks:

: C.D.C. # 391 1190

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 3,9L  
Edition : 16.07.91  
replaces : 31.01.89  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R310-1  
Type number : 0 460 424 043  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4 TA 390 /66KW

Power KW: 66  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,55  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.20...3.60  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 4.30...4.90  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 750  
Del. quantity cm<sup>3</sup>/  
1000S.: 85.00...86.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.00...16.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1155  
Del. quantity cm<sup>3</sup>/  
1000S.: 50.00...58.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
mind 1000S.: 70.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 4.80...5.60  
mm: (4.50...5.90)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 750  
 TD travel mm: 3.20...3.60  
                     mm: (2.70...4.10)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 TD travel mm: 1.60...2.40  
                     mm: (1.30...2.70)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 3.20...3.80  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 750  
 Supply-pump pressure bar: 4.30...4.90  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 5.80...6.40  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.40)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1215  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 3rd speed 1/min: 1170  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...60.00  
                     1000S.: (10.00...60.00)  
 Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1155

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 50.00...58.00  
                     1000S.: (46.00...62.00)  
 9th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 68.00...71.00  
                     1000S.: (66.50...72.50)  
 10th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 75.00...78.00  
                     1000S.: (73.00...80.00)  
 12th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 85.00...86.00  
                     1000S.: (82.50...88.50)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 85.00...93.00  
                     1000S.: (83.00...95.00)  
 Mech. shutoff:  
 Electr. shutoff:  
 1st speed 1/min: 450  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Idle delivery:  
 1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...16.00  
                     1000S.: (8.00...18.00)  
 Dispersion cm3/: 5.5  
                     1000S.: (7.0)  
 2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...4.00  
                     1000S.: (0.00...4.00)  
 Automatic starting fuel delivery:  
 1st speed 1/min: 250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 85.00...135.00  
                     1000S.: (85.00...135.00)  
 2nd speed 1/min: 450



Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 70.00...100.00  
1000S.: (70.00...100.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 70.00...120.00  
1000S.: (70.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation	
K	mm: -
KF	mm: 5,0...5,4
MS	mm: 0,8...1,2
SVS max.	mm: 1,3
XK	mm: 18,1...20,8
XL	mm: 9,9...13,3

Remarks:  
: C.D.C. # 391 2111  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P16  
Edition : 16.07.91  
replaces : 23.04.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1250R359-1  
Type number : 0 460 424 055  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BT- 390 AUTOM.

Power KW: 77  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1,0  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values

Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.90...2.30  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 5.40...6.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 73.00...74.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 43.50...44.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 7.50...11.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1340

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Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 54.00...60.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 90.00...170.00  
mind 1000S.: 90.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 400\*  
Charge press. hPa: -  
TD travel mm: 2.70...3.70  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 2.70...3.30

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 4.40...5.00

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 5.40...6.00

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1250  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 6.00...6.60

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 600  
LDA-stroke mm: 6,4  
KSB/AFB  
valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 71.00...72.00  
                     1000S.: (67.50...75.50)  
 2nd speed 1/min: 1500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 3rd speed 1/min: 1400  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
                     1000S.: (15.00...55.00)  
 5th speed 1/min: 1340  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 54.00...60.00  
                     1000S.: (51.00...63.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 68.50...71.50  
                     1000S.: (67.00...73.00)  
 12th speed 1/min: 850  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 73.00...74.00  
                     1000S.: (70.50...76.50)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 43.50...44.50  
                     1000S.: (40.00...48.00)  
  
 Mech. shutoff:  
 Mech. Abstellung:  
  
 1st speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12  
 KSB/AFB  
 valve Volt: 12  
  
 Electr. shutoff:  
  
 1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
  
 Idle delivery:  
  
 1st speed 1/min: 350  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 7.50...11.50  
                     1000S.: (4.50...14.50)  
 Dispersion cm<sup>3</sup>/: 5.5  
                     1000S.: (7.0)  
 2nd speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...6.00  
                     1000S.: (0.00...6.00)  
  
 Automatic starting fuel delivery:  
  
 1st speed 1/min: 150  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 80.00...160.00  
                     1000S.: (80.00...160.00)  
  
 2nd speed 1/min: 280  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...80.00  
                     1000S.: (0.00...80.00)  
  
 4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 90.00...170.00  
                     1000S.: (90.00...170.00)  
  
 Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3,6...3,8
KF	mm: K-OT
MS	mm: 1,3...1,7
SVS max.	mm: 2,7
LDA stroke	mm: 6,4
XK	mm: 21,8...23,8
XL	mm: 11,7...15,1

Operate control lever after each  
manifold-pressure compensator pressure  
change. : C.D.C. # 391 1242

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P26  
Edition : 16.07.91  
replaces : 21.06.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1000R378-1  
Type number : 0 460 424 059  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4 BTA 3.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50,00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm: 1,8  
mm:  $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.40...2.80  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.00...4.60  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 900  
Del. quantity cm<sup>3</sup>/  
1000S.: 69.00...70.00  
Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...13.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/  
1000S.: 37.50...43.50  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...110.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1000  
TD travel mm: 2.70...3.50  
mm: (2.40...3.80)  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 900

TD travel mm: 2.40...2.80  
 mm: (1.90...3.30)  
 Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 750  
 TD travel mm: 1.30...2.10  
 mm: (1.00...2.40)  
 Shutoff  
 electromagnet Volt: 24  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 2.20...2.80  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 900  
 Supply-pump pressure bar: 4.00...4.60  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1000  
 Supply-pump pressure bar: 4.40...5.00  
 Shutoff  
 electromagnet Volt: 24  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1130  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1070  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 15.00...45.00  
 1000S.: (15.00...45.00)  
 5th speed 1/min: 1050  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 37.50...43.50  
 1000S.: (34.50...46.50)  
 9th speed 1/min: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 67.00...70.00  
 1000S.: (65.50...71.50)  
 10th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 72.50...75.50  
 1000S.: (70.50...77.50)  
 12th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 69.00...70.00  
 1000S.: (66.50...71.50)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 71.50...79.50  
 1000S.: (69.50...81.50)

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 7.00...13.00  
 1000S.: (5.00...15.00)

Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)

2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 95.00...135.00  
 1000S.: (95.00...135.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 55.00...85.00  
1000S.: (55.00...85.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...110.00  
1000S.: (70.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,0...5,4  
MS mm: 1,1...1,5  
SVS max. mm: 3,0

Remarks:  
: C.D.C. # 391 7027

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P40  
Edition : 12.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1250R378-2  
Type number : 0 460 424 060  
Customer Part-No. : 3 917 029

Customer-specific information  
Customer : CDC

Engine : 4 BT 3.9  
Speed 1/min: 1250

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50,00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.00...2.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.60...5.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000S.: 57.50...58.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 335  
Del. quantity cm3/  
1000S.: 8.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1300  
Del. quantity cm3/  
1000S.: 40.00...46.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
mind 1000S.: 70.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900

TD travel mm: 2.00...2.40  
 mm: (1.50...2.90)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 750  
 TD travel mm: 0.80...1.60  
 mm: (0.50...1.90)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 2.70...3.30  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 900  
 Supply-pump pressure bar: 4.60...5.20  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 5.40...6.00  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 750  
 Supply-pump pressure bar: 3.90...4.50  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1460  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1330  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 15.00...55.00  
 1000S.: (15.00...55.00)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...46.00  
 1000S.: (37.00...49.00)  
 9th speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 55.50...58.50  
 1000S.: (54.00...60.00)  
 11th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 55.50...59.50  
 1000S.: (53.50...61.50)  
 12th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm3/: 57.50...58.50  
 1000S.: (55.00...61.00)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 49.00...57.00  
 1000S.: (47.00...59.00)  
 Mech. shutoff:  
 Mech. Abstimmung:  
 1st speed 1/min: 1250  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12  
 Electr. shutoff:  
 1st speed 1/min: 335  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Idle delivery:  
 1st speed 1/min: 335  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 8.00...14.00  
 1000S.: (6.00...16.00)  
 Dispersion cm3/: 5.5  
 1000S.: (7.0)  
 2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...4.00  
 1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 75.00...125.00  
1000S.: (75.00...125.00)

2nd speed 1/min: 300

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: (40.00...80.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000S.: (70.00...120.00)

Shutoff electromagnet:

Cut-in

min voltage : 10,0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5,0...5,4

MS mm: 0,8...1,2

SVS max. mm: 4,8

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N27  
Edition : 12.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1100R378-4  
Type number : 0 460 424 062  
Customer Part-No. : 3 917 032

Customer-specific information  
Customer : CDC

Engine : 4 BT 3.9 IND.

Power KW: 59  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50,00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000S.: 58.50...59.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1150  
Del. quantity cm3/  
1000S.: 45.00...51.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 110  
Del. quantity cm3/: 50.00...100.00  
mind 1000S.: 50.00  
Shutoff  
electromagnet Volt: 12

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 900  
TD travel mm: 2.30...2.70  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2.30...2.90

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump pressure bar: 4.10...4.70

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Supply-pump pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1170  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...51.00  
1000S.: (42.00...54.00)

9th speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.00...61.00  
1000S.: (56.50...62.50)

11th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.50...61.50  
1000S.: (55.50...63.50)

12th speed 1/min: 900  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.50...59.50  
1000S.: (56.00...62.00)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...58.00  
1000S.: (48.00...60.00)

Mech. shutoff:  
Mech. Abstimmung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...120.00  
1000S.: (80.00...120.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: (40.00...80.00)

4th speed 1/min: 110  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...100.00  
1000S.: (50.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5,0...5,4
MS	mm: 1,1...1,5
SVS max.	mm: 3,2

Remarks:

⋮

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N24  
Edition : 12.07.91  
replaces : 31.10.90  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R378-4  
Type number : 0 460 424 062  
Customer Part-No. : 3 917 554

Customer-specific information  
Customer : CDC

Engine : 4 BT 3.9 IND.

Power KW: 68  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 900  
Del. quantity cm<sup>3</sup>/  
1000S.: 68.00...69.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 9.00...15.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1160  
Del. quantity cm<sup>3</sup>/  
1000S.: 34.00...71.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 900  
 TD travel mm: 2.30...2.70  
 mm: (1.80...3.20)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 750  
 TD travel mm: 1.30...2.10  
 mm: (1.00...2.40)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump pressure bar: 2.30...2.90  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 900  
 Supply-pump pressure bar: 4.10...4.70  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 4.90...5.50  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1230  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1175  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 32.50...37.50  
 1000S.: (30.00...40.00)  
 5th speed 1/min: 1160  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 34.00...71.00  
 1000S.: -  
 9th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 65.50...68.50  
 1000S.: (64.00...70.00)  
 11th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...74.00  
 1000S.: (68.00...76.00)  
 12th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 68.00...69.00  
 1000S.: (65.50...71.50)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...78.00  
 1000S.: (68.00...80.00)

Mech. shutoff:  
 Mech. Abstimmung:

1st speed 1/min: 1100  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.00...15.00  
 1000S.: (7.00...17.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)  
 2nd speed 1/min: 530  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Shutoff  
 electromagnet Volt: 12



Del. quantity cm<sup>3</sup>/: 80.00...120.00  
1000S.: (80.00...120.00)

2nd speed 1/min: 240

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: (40.00...80.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000S.: (70.00...120.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5,0...5,4

MS mm: 1,1...1,5

SVS max. mm: 3,5

Remarks:

:  
Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N26  
Edition : 12.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1100R378-4  
Type number : 0 460 424 062  
Customer Part-No. : 3 917 555

Customer-specific information  
Customer : CDC

Engine : 4 BT 3.9 IND.

Power KW: 68  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000S.: 68.00...69.00  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 9.00...15.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1160  
Del. quantity cm3/  
1000S.: 34.00...71.00  
Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 900  
TD travel mm: 2.30...2.70  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 750  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.30...2.90

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4.10...4.70

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

2nd speed 1/min: 1230  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1175  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 32.50...37.50  
1000S.: (30.00...40.00)  
5th speed 1/min: 1160  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 34.00...71.00  
1000S.: -

9th speed 1/min: 1100

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.50...68.50  
1000S.: (64.00...70.00)

11th speed 1/min: 750

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...74.00  
1000S.: (68.00...76.00)

12th speed 1/min: 900

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 68.00...69.00  
1000S.: (65.50...71.50)

20th speed 1/min: 500

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...78.00  
1000S.: (68.00...80.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 9.00...15.00  
1000S.: (7.00...17.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 530

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 80.00...120.00  
1000S.: (80.00...120.00)

2nd speed 1/min: 240

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: (40.00...80.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000S.: (70.00...120.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5,0...5,4

MS mm: 1,1...1,5

SVS max. mm: 3,5

Remarks:

:  
Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P4  
Edition : 16.07.91  
replaces : 28.03.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1150R374-1  
Type number : 0 460 424 063  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BTA 3.9 IND.

Power KW: 82  
Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,55  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values

H03

Test specifications in parentheses

Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 850  
Charge press hPa: 1000  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 85.50...86.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1220  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 62.50...68.50  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100

Del. quantity cm<sup>3</sup>/: 60.00...130.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1150  
Charge press hPa: 1000  
TD travel mm: 5.20...6.00  
mm: (4.90...6.30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 4.00...4.40  
mm: (3.50...4.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 1.80...2.60  
mm: (1.50...2.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.00...4.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.60...6.20

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1150  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1150  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.50...80.50  
1000S.: (76.00...84.00)

2nd speed 1/min: 1320  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1260  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1220  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 62.50...68.50  
1000S.: (59.50...71.50)

9th speed 1/min: 1150  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 76.00...79.00  
1000S.: (74.50...80.50)

10th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.50...82.50  
1000S.: (77.50...84.50)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.50...86.50  
1000S.: (83.00...89.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (60.00...68.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

KSB/AFB  
valve Volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...130.00  
1000S.: (60.00...130.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...130.00  
1000S.: (60.00...130.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -

H05

KF mm: 5,0...5,4  
MS mm: 1,0...1,4  
SVS max. mm: 2,6

Remarks:  
: C.D.C. # 391 7519

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N31  
Edition : 15.07.91  
replaces : 18.01.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1050R389  
Type number : 0 460 424 065  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BT- 390 AUTOM.

Power KW: 81  
Speed 1/min: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1.55  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

H06

## Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 5,0...5,6  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 89.50...90.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1100  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 59.00...65.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
mind 1000S.: 60.00



Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1050  
Charge press hPa: 1000  
TD travel mm: 4.70...5.50  
mm: (4.40...5.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 3.40...3.80  
mm: (2.90...4.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 1.70...2.50  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.90...4.50

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.00...5.60

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.30...6.90

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)  
2nd speed 1/min: 1050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 79.50...80.50  
1000s.: (76.00...84.00)

2nd speed 1/min: 1180  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000s.: (0.00...3.00)

5th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 59.00...65.00  
1000s.: (56.00...68.00)

6th speed 1/min: 1120  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 15.00...55.00  
1000s.: (15.00...55.00)

9th speed 1/min: 1050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 76.50...79.50  
1000s.: (75.00...81.00)

12th speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 89.50...90.50  
1000s.: (87.00...93.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 63.50...64.50  
1000s.: (60.00...68.00)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1050  
Charge press. hPa: 1000  
Del. quantity cm3/: 0.00...3.00  
1000s.: (0.00...3.00)  
Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
1000S.: (60.00...140.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
1000S.: (60.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -  
KF mm: 5,0...5,4  
MS mm: 1,0...1,4  
SVS max. mm: 2,2

Remarks:

: C.D.C. # 391 7516  
:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 3,9 M  
Edition : 15.07.91  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R391  
Type number : 0 460 424 068  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4 TA 390 /66KW

Power KW: 66  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): 0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,55  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values

H09

Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3.30...3.70  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 83.50...84.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 63.00...64.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.50...14.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1170  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 36.50...42.50  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100

Del. quantity cm3/: 50.00...100.00  
mind 1000S.: 50.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 4.50...5.30  
mm: (4.20...5.60)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 3.30...3.70  
mm: (2.80...4.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.40...4.00

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.50...5.10

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.90...6.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 650\*  
Charge-air pressure-setting  
point hPa: 325  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 77.50...78.50  
1000S.: (74.00...82.00)

2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1190  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 15.00...45.00  
1000S.: (15.00...45.00)

5th speed 1/min: 1170  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 36.50...42.50  
1000S.: (33.50...45.50)

9th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 67.00...70.00  
1000S.: (65.50...71.50)

10th speed 1/min: 900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 73.50...77.50  
1000S.: (72.00...79.00)

12th speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm3/: 83.50...84.50  
1000S.: (81.00...87.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 63.00...64.00  
1000S.: (60.00...67.00)

20th speed 1/min: 500  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 84.00...92.00  
1000S.: (82.00...94.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.50...14.50  
1000S.: (6.50...16.50)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.00...135.00  
1000S.: (75.00...135.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...100.00  
1000S.: (50.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -

H11

KF mm: 5,0...5,4  
MS mm: 0,8...1,2  
SVS max. mm: 1,3

Remarks:  
Operate control lever after each 26  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 3,9 M1  
Edition : 15.07.91  
replaces : -  
Calibrating oil : ISO-4113  
Injection pump : VE4/12F1100R391-1  
Type number : 0 460 424 072  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4BT-3.9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 2.10...2.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 72.00...73.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 45.50...46.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 8.50...14.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1170  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...120.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 2.80...3.60  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 2.10...2.50  
mm: (1.60...3.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
Charge press hPa: 1000  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.10...3.70

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.20...4.80

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.80...6.40

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)

2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting point hPa: 325  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 68.50...69.50  
(65.00...73.00)

2nd speed 1/min: 1280  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00  
(0.00...3.00)  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...15.00  
(0.00...15.00)

4th speed 1/min: 1180  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 15.00...55.00  
(15.00...55.00)

5th speed 1/min: 1170  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 47.00...53.00  
(44.00...56.00)

9th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 62.00...65.00  
(60.50...66.50)

10th speed 1/min: 900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 63.50...68.50  
(62.00...70.00)

12th speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 72.00...73.00  
(69.50...75.50)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 45.50...46.50  
(42.00...50.00)

Mech. shutoff:  
Mech. Abst. ellung:

1st speed 1/min: 1100

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.50...14.50  
1000S.: (6.50...16.50)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.00...115.00  
1000S.: (55.00...115.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...65.00  
1000S.: (15.00...65.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -  
KF mm: 5,0...5,4  
MS mm: 1,2...1,6

H14

SVS max. mm: 2,5

Remarks:

: CASE # 391 7014  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P43  
Edition : 15.07.91  
replaces : -  
Calibrating oil : ISO-4113  
Injection pump : VE4/12F1100R378-7  
Type number : 0 460 424 074  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4 BT-390

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm: 2,35  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
Del. quantity cm<sup>3</sup>/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 475  
Del. quantity cm<sup>3</sup>/  
1000S.: 6.00...12.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1160  
Del. quantity cm<sup>3</sup>/  
1000S.: 31.50...38.50  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900

TD travel mm: 2.30...2.70  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 650  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.40...3.00  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...40.00  
1000S.: (10.00...40.00)  
5th speed 1/min: 1160  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...38.50  
1000S.: (29.00...41.00)  
9th speed 1/min: 1100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (59.00...65.00)

10th speed 1/min: 900  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.80...63.80  
1000S.: (58.80...65.80)

12th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (61.00...67.00)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.00...69.00  
1000S.: (59.00...71.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 475  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...12.00  
1000S.: (4.00...14.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...130.00  
1000S.: (70.00...130.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: (30.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000S.: (70.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: K-OT
MS	mm: 1,2...1,6
SVS max.	mm: 3,2

Remarks:

: C.D.C. # 391 7528  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6 N  
Edition : 15.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1350R407  
Type number : 0 460 424 075  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8040.25.4000 TC

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80

Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 78.50...79.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 50.50...51.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 250  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1525  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 30.00...36.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 2.20...3.00  
 mm: (1.70...3.50)

Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.40...1.80  
 mm: (0.70...2.50)

5th speed 1/min: 1350  
 Charge press. hPa: 1000  
 TD travel mm: 3.70...4.50  
 mm: (3.20...5.00)

Shutoff  
 electromagnet Volt: 24

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.70...4.30

Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5.70...6.30

Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.50...8.10

Shutoff  
 electromagnet Volt: 24

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...83.40

quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

# Delivery-quant. and breakaway char.:

1nd speed 1/min: 600\*

# Charge-air pressure-setting point

hPa: 375  
 LDA-stroke mm: 6,7

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 69.00...70.00  
 1000S.: (65.50...73.50)

2nd speed 1/min: 1600  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 1525  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 30.00...36.00  
 1000S.: (27.00...39.00)

8th speed 1/min: 1475  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 43.00...51.00  
 1000S.: (41.00...53.00)

9th speed 1/min: 1350  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 68.50...71.50  
 1000S.: (66.50...73.50)

10th speed 1/min: 1200  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 71.00...75.00  
 1000S.: (69.50...76.50)

12th speed 1/min: 700  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quynity cm<sup>3</sup>/: 79.00...80.00  
 1000S.: (76.00...83.00)

18th speed 1/min: 600  
 Charge press. hPa: -

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 51.50...52.50  
 1000S.: (48.50...55.50)

20th speed 1/min: 600  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 82.50...86.50  
 1000S.: (81.00...88.00)

21th speed 1/min: 500  
 Charge press. hPa: -

Shutoff  
 electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 50.00...54.00  
1000S.: (48.00...56.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1350  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)

2nd speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 45.00...65.00  
1000S.: (45.00...65.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0

H2O

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: 3,7
KF	mm: K-OT
MS	mm: 0,7...1,1
LDA stroke	mm: 6,7

Operate control lever after each  
manifold-pressure compensator pressure  
change. :

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6 N1  
Edition : 15.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1350R407-1  
Type number : 0 460 424 076  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8040.45.4000 TCA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.90...2.30

Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 5.80...6.40  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 72.00...73.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 42.50...43.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 250  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1525  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 23.00...29.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 2.20...3.00  
 mm: (1.70...3.50)

Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.40...1.80  
 mm: (0.70...2.50)

Shutoff  
 electromagnet Volt: 24  
 5th speed 1/min: 1350  
 Charge press. hPa: 1000  
 TD travel mm: 3.70...4.50  
 mm: (3.20...5.00)

Shutoff  
 electromagnet Volt: 24

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.10...4.70  
 Shutoff

electromagnet Volt: 24  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5.80...6.40  
 Shutoff

electromagnet Volt: 24  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.20...7.80  
 Shutoff

electromagnet Volt: 24

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 104.25...145.95  
 quantity cm<sup>3</sup>/10s: (89.25...160.95)

2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 111.20...194.60  
 quantity cm<sup>3</sup>/10s: (96.20...209.60)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 600\*  
 Charge-air pressure-setting point hPa: 510  
 LDA-stroke mm: 6,9  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 62.00...63.00  
 1000S.: (58.50...66.50)

2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 1525  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 30.00...36.00  
 1000S.: (27.00...39.00)

8th speed 1/min: 1450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 49.00...57.00  
 1000S.: (47.00...59.00)

9th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 63.00...66.00  
 1000S.: (61.00...68.00)

10th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 64.50...68.50  
 1000S.: (63.00...70.00)

12th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quynntity cm<sup>3</sup>/: 72.00...73.00  
 1000S.: (69.00...76.00)

18th speed 1/min: 600  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 42.50...43.50  
 1000S.: (39.50...46.50)

20th speed 1/min: 600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 74.50...78.50  
 1000S.: (73.00...80.00)

21th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24



Del. quantity cm<sup>3</sup>/: 41.00...45.00  
1000S.: (39.00...47.00)

Mech. shutoff:  
Mech. Abstimmung:

1st speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)

2nd speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 30.00...50.00  
1000S.: (45.00...65.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3,7  
KF mm: K-OT  
MS mm: 0,7...1,1  
LDA stroke mm: 6,9

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P35  
Edition : 15.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1050R389-2  
Type number : 0 460 424 078  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BT- 390 AUTOM.

Power KW: 78  
Speed 1/min: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm: 1,55  
mm:  $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

H24

## Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 5.00...5.60  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 89.50...90.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1100  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 59.00...65.00  
Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
mind 1000S.: 60.00

Shutoff

electromagnet Volt: 24

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1050  
Charge press hPa: 1000  
TD travel mm: 4.70...5.50  
mm: (4.40...5.80)

Shutoff

electromagnet Volt: 24

3rd speed 1/min: 750

Charge press hPa: 1000

TD travel mm: 3.40...3.80  
mm: (2.90...4.30)

Shutoff

electromagnet Volt: 24

4th speed 1/min: 500

Charge press hPa: 1000

TD travel mm: 1.70...2.50  
mm: (1.40...2.80)

Shutoff

electromagnet Volt: 24

TD travel mm: 0.00...6.40  
mm: (0.00...1.00)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.90...4.50

Shutoff

electromagnet Volt: 24

3rd speed 1/min: 750

Charge press. hPa: 1000

Supply-pump pressure bar: 5.00...5.60

Shutoff

electromagnet Volt: 24

4th speed 1/min: 1050

Charge press. hPa: 1000

Supply-pump pressure bar: 6.30...6.90

Shutoff

electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500

Charge press. hPa: -

Shutoff

electromagnet Volt: 24

Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1050

Charge press. hPa: 1000

Shutoff

electromagnet Volt: 24

Overflow : 55.60...139.00

quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*

Charge-air pressure-setting point hPa: 350

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 79.50...80.50  
1000S.: (76.00...84.00)

2nd speed 1/min: 1180

Charge press. hPa: 1000

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1120

Charge press. hPa: 1000

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1100

Charge press. hPa: 1000

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 59.00...65.00  
1000S.: (56.00...68.00)

9th speed 1/min: 1050

Charge press. hPa: 1000

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 76.50...79.50  
1000S.: (75.00...81.00)

12th speed 1/min: 750

Charge press. hPa: 1000

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 89.50...90.50  
1000S.: (87.00...93.00)

18th speed 1/min: 500

Charge press. hPa: -

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (60.00...68.00)

Mech. shutoff:

Mech. Abstellung:

1st speed 1/min: 1050

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff

electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
1000S.: (60.00...140.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
1000S.: (60.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5,0...5,4
MS	mm: 1,0...1,4
SVS max.	mm: 2,2

Remarks:

: C.D.C. # 391 7517

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P36  
Edition : 15.07.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1100R374-3  
Type number : 0 460 424 080  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BTA 3.9

Power KW: 80  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0,5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,55  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values

H27

Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3.80...4.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 85.50...86.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1145  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 65.00...71.00

KSB/AFB  
valve Volt: 12

Start:

Speed 1/min: 100

Del. quantity cm<sup>3</sup>/: 65.00...105.00  
mind 1000S.: 65.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 5.20...6.00  
mm: (4.90...6.30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 3.80...4.20  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 2.10...2.90  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.00...4.60  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.10...5.70  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.70...7.30  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 81.50...82.50  
1000S.: (78.00...86.00)

2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1180  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1145  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 65.00...71.00  
1000S.: (62.00...74.00)

9th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 76.00...79.00  
1000S.: (74.50...80.50)

10th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 78.50...81.50  
1000S.: (76.50...83.50)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.50...86.50  
1000S.: (83.00...89.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (60.00...68.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 455  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 65.00...125.00  
1000S.: (65.00...125.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: (35.00...65.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 65.00...105.00  
1000S.: (65.00...105.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -

J01

KF mm: 5,0...5,4  
MS mm: 1,0...1,4  
SVS max. mm: 2,4  
XK mm: 21.8...23.8  
XL mm: 11.4...14.8

Remarks:

: C.D.C. # 391 7020  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N30  
Edition : 12.07.91  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE4/12F1100R378-8  
Type number : 0 460 424 081

Customer-specific information  
Customer : CDC

Engine : 4 BT

Power KW: 67  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.0...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0,30...0,40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253,00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

J02

Speed 1/min: 900  
Setting value mm: 2,3...2,7  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4,1...4,7  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000S.: 68,0...69.0

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4,0  
1000S.: (4,5)

Low-idle speed regulation

Speed 1/min: 475  
Del. quantity cm3/  
1000S.: 10,5...16,5

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5,5  
1000S.: (7,0)

Full-load speed regulation

Speed 1/min: 1175  
Del. quantity cm3/  
1000S.: 32,5...37,5

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: -  
mind 1000S.: 65,0  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
electromagnet Volt: 12  
2nd speed 1/min: 900



TD travel mm: 2,3...2,7  
mm: (1,8...3,2)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
TD travel mm: 3,4...4,1  
mm: (3,0...4,4)

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,3...2,9  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump pressure bar: 4,1...4,7  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Supply-pump pressure bar: 4,9...5,5  
Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...154)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 1230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000S.: -  
2nd speed 1/min: 1175  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32,5...37,5  
1000S.: (30,0...40,0)  
3rd speed 1/min: 1160  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34,0...71,0  
1000S.: -  
4th speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 65,5...68,5  
1000S.: (64,0...70,0)  
5th speed 1/min: 900

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 68,0...69,0  
1000S.: (65,5...71,5)

6th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70,0...74,0  
1000S.: (68,0...76,0)

7th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70,0...78,0  
1000S.: (68,0...80,0)

Mech. shutoff:  
Mech. Abst. ellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000S.: -

Shutoff  
electromagnet volt: 12

#### Electr. shutoff:

1st speed 1/min: 475  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10,5...16,5  
1000S.: (8,5...18,5)  
2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000S.: -

#### Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80,0...120,0  
1000S.: -

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40,0...80,0  
1000S.: -

Shutoff electromagnet:

Cut-in

min voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5,0...5,4

MS mm: 1,1...1,5

SVS max. mm: 3,2

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 R  
Edition : 15.07.91  
replaces : 10.85  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1325R198  
Type number : 0 460 426 063  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BT 5.9 IND.

Power KW: 97  
Speed 1/min: 2650

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,5  
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

J05

## Timing-device travel

Speed 1/min: 850  
Setting value mm: 3.90...4.30  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 850  
Setting value bar: 3.90...4.50  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000S.: 56.00...57.00  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1400  
Del. quantity cm3/  
1000S.: 36.00...42.00  
Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 5.90...6.70  
mm: (5.60...7.00)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 850  
TD travel mm: 3.90...4.30  
mm: (3.40...4.80)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 500  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.50...3.10  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 850  
Supply-pump  
pressure bar: 3.90...4.50  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1325  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

2nd speed 1/min: 1520  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
4th speed 1/min: 1440  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: (15.00...45.00)  
5th speed 1/min: 1400  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 36.00...42.00  
1000S.: (33.00...45.00)  
9th speed 1/min: 1325

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 52.50...55.50  
1000S.: (51.00...57.00)

11th speed 1/min: 850

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 53.50...57.50  
1000S.: (51.50...59.50)

12th speed 1/min: 1100

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 56.00...57.00  
1000S.: (53.50...59.50)

20th speed 1/min: 500

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 38.50...46.50  
1000S.: (36.50...48.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1325  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: -

#### Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24

Del. quantity cm3/: 65.00...115.00  
1000S.: (65.00...115.00)

2nd speed 1/min: 250

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 15.00...65.00  
1000S.: (15.00...65.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5,0...5,4

MS mm: 1,3...1,7

XK mm: 20,2...22,2

XL mm: 9,1...12,5

Remarks:

: C.D.C. # 390 8217

:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 C  
Edition : 15.07.91  
replaces : 06.11.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1300R240  
Type number : 0 460 426 084  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : T6 60 cc Truck

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,25  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,0  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.30...1.70  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 6.50...7.10  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 99.00...100.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm<sup>3</sup>/  
1000S.: 87.00...88.00

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 16.50...20.50

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1450  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/  
mind 1000S.: 120.0  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1300  
Charge press hPa: 1000  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 1.30...1.70  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 0.40...1.20  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.30...7.90

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.50...7.10

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.90...4.50  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 6,3  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 95.00...96.00  
1000S.: (92.50...98.50)

2nd speed 1/min: 1520  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 13.50...21.50  
1000S.: (10.50...24.50)

3rd speed 1/min: 1580  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...7.00  
1000S.: (0.00...7.00)

5th speed 1/min: 1450  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 47.00...53.00  
1000S.: (44.00...56.00)

9th speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 95.00...98.00  
1000S.: (93.50...99.50)

10th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 99.50...102.50  
1000S.: (98.00...104.00)

12th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quynity cm<sup>3</sup>/: 99.00...100.00  
1000S.: (96.50...102,50)

18th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 87.00...88.00  
1000S.: (84.50...90.50)

20th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 81.00...82.00  
1000S.: (78,5...84,50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 16.50...20.50  
1000S.: (13.50...23.50)  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 4.50...10.50  
1000S.: (2.50...12.50)  
4th speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: (0.00...2.60)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 120.00...160.00  
1000S.: (95.00...145.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 120.00...160.00  
1000S.: (120.00...160.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: K-OT  
MS mm: 0,6...1,0  
SVS max. mm: 3,2  
LDA stroke mm: 6,3  
XK mm: 17,0...19,0  
XL mm: 12,8...16,2

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 A  
Edition : 15.07.91  
replaces : 18.04.88  
Calibrating oil : ISO-4113

Injection pump : VE6/12F1300R241  
Type number : 0 460 426 085  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : T6 60

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0,6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 2.10...2.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 7.20...7.80  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 92.00...93.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 77.50...80.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1400  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 52.00...58.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 90.00...130.00  
mind 1000S.: 90.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1300  
 Charge press hPa: 1000  
 TD travel mm: 2.90...3.70  
                     mm: (2.60...4.00)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 2.10...2.50  
                     mm: (1.60...3.00)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 950  
 Charge press hPa: 1000  
 TD travel mm: 0.50...1.10  
                     mm: (0.10...1.50)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 1300  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 8.00...8.60  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.20...7.80  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 700  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5.50...6.10  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 1300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 1st speed 1/min: 700\*

Charge-air pressure-setting  
 point hPa: 350  
 LDA-stroke mm: 6,1  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 83.50...84.50  
                     1000S.: (81.00...87.00)  
 2nd speed 1/min: 1480  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 8.00...16.00  
                     1000S.: (5.00...19.00)  
 3rd speed 1/min: 1530  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 5th speed 1/min: 1400  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 52.00...58.00  
                     1000S.: (49.00...61.00)  
 9th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 84.50...87.50  
                     1000S.: (83.00...89.00)  
 10th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 90.00...93.00  
                     1000S.: (88.50...94.50)  
 12th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 92.00...93.00  
                     1000S.: (89.50...95.50)  
 18th speed 1/min: 700  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 77.50...80.50  
                     1000S.: (76.00...82.00)  
 20th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 71.50...74.50  
                     1000S.: (70.00...76.00)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1300

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 4.00...10.00  
1000S.: (2.00...12.00)

4th speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: (0.00...2.60)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 100.00...140.00  
1000S.: (100.00...140.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: (40.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...130.00  
1000S.: (90.00...130.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: K-OT
MS	mm: 1,1...1,3
SVS max.	mm: 6,0
LDA stroke	mm: 6,1
XK	mm: 20,0...22,0
XL	mm: 10,5...13,9

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L10  
Edition : 15.07.91  
replaces : 28.03.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1100R173-7  
Type number : 0 460 426 089  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BTA-590 I

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,85  
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.00...2.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.30...4.90  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
Del. quantity cm<sup>3</sup>/  
1000S.: 68.50...69.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 9.00...13.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/  
1000S.: 52.00...58.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 2.60...3.40  
mm: (2.30...3.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900

TD travel mm: 2.00...2.40  
 mm: (1.50...2.90)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 700  
 TD travel mm: 0.70...1.50  
 mm: (0.40...1.80)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 2.30...2.90  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 900  
 Supply-pump pressure bar: 4.30...4.90  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 4.90...5.50  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1220  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000s.: (0.00...3.00)  
 Del. quantity cm<sup>3</sup>/: 0.00...15.00  
 1000s.: (0.00...15.00)  
 4th speed 1/min: 1180  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
 1000s.: (15.00...55.00)  
 5th speed 1/min: 1150  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 52.00...58.00  
 1000s.: (49.00...61.00)  
 9th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 64.00...67.00  
 1000s.: (62.50...68.50)  
 10th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 64.50...67.50  
 1000s.: (63.00...69.00)  
 12th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 68.50...69.50  
 1000s.: (66.00...72.00)  
 Delivery-quant. and breakaway char.:  
 Inj.-qty.values,temp.-compensated  
 temperatura  
 1000s.: (0.00...3.00)  
 Mech. shutoff:  
 Mech. Abstellung:  
 1st speed 1/min: 1100  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000s.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12  
 Electr. shutoff:  
 1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000s.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Idle delivery:  
 1st speed 1/min: 375  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.00...13.00  
 1000s.: (6.00...16.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000s.: (7.0)  
 2nd speed 1/min: 430  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000s.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 140  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 60.00...120.00  
1000S.: (60.00...120.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 30.00...60.00  
1000S.: (30.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5,0...5,4
MS	mm: 1,2...1,6
SVS max.	mm: 2,7
XK	mm: 20,2...22,2
XL	mm: 11,2...14,6

Remarks:

: C.D.C. #390 4731  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W35  
 Copl. date: : -  
 Edition : 12.07.91  
 replaces : 19.04.90  
 Calibrating oil : ISO-4113

Injection pump : VE6/12F1100R376  
 Type number : 0 460 426 147  
 Customer Part-No. : 391 7559

Customer-specific information  
 Customer : CDC

Engine : 6 BT- 5.9 IND  
 Speed 1/min: 1100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40.00...48.00  
 Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 Pressure bar: 250.00...253.00

Perforated-plate  
 diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
 x Wall thickness : 2.00  
 x Length mm: 840

Start of delivery  
 Prestroke mm: 0,3  
 (from BDC): +0,2(0,04)

Start of delivery block  
 Piston stroke mm: 1,5  
 mm: +0,02(0,06)

Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
 Setting value mm: 3.10...3.50  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
 Setting value bar: 4.10...4.70  
 Shutoff  
 electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
 Del. quantity cm3/  
 1000S.: 80.00...81.00  
 Shutoff  
 electromagnet Volt: 12  
 Dispersion cm3/: 4.0  
 1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 400  
 Del. quantity cm3/  
 1000S.: 6.00...12.00  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 5.5  
 1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1150  
 Del. quantity cm3/  
 1000S.: 50.50...56.50  
 Shutoff  
 electromagnet Volt: 12

Start:

Speed 1/min: 100  
 Del. quantity cm3/: 80.00...140.00  
 mind 1000S.: 80.00  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
 TD travel mm: 5.60...6.40  
 mm: (5.30...6.70)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 750

TD travel mm: 3.10...3.50  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
TD travel mm: 1.00...1.80  
mm: (0.70...2.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 3.00...3.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 4.10...4.70

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.70)  
2nd speed 1/min: 1100

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1165  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.50...56.50  
1000S.: (47.50...59.50)

9th speed 1/min: 1100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 68.50...71.50  
1000S.: (67.00...73.00)

10th speed 1/min: 900  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 72.50...75.50  
1000S.: (70.50...77.50)

12th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 80.00...81.00  
1000S.: (77.50...83,50)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
1000S.: (82.00...90.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...12.00  
1000S.: (4.00...14.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)  
2nd speed 1/min: 470  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 95.00...165.00  
1000S.: (95.00...165.00)

2nd speed 1/min: 250



Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.00...95.00  
1000S.: (55.00...95.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...140.00  
1000S.: (80.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,0...5,4  
MS mm: 1,2...1,6  
SVS max. mm: 1,8  
XK mm: 18,8...20,8  
XL mm: 11.9...15,3

Remarks:  
: C.D.C. # 391 7559

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W63  
Edition : 12.07.91  
replaces : 20.06.90  
Calibrating oil : ISO-4113

Injection pump : VE6/12F1300R377-1  
Type number : 0 460 426 174  
Customer Part-No. :

Customer-specific information  
Customer : CUMMINS

Engine : 6 BT 5.9 A

Power KW: 217  
Speed 1/min: 2600

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 2,35  
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values

J20

Test specifications in parentheses

Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 2.60...3.00  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 850  
Charge press hPa: 1000  
Setting value bar: 6.60...7.20  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 73.50...74.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 50.50...51.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 9.0  
1000S.: (9.0)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 9.00...11.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1400  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 54.00...60.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1300  
Charge press hPa: 1000  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 2.60...3.00  
mm: (2.10...3.50)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 700  
Charge press hPa: 1000  
TD travel mm: 1.40...2.20  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.80...5.40

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.60...7.20

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 8.60...9.20  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 104.25...145.95  
quantity cm<sup>3</sup>/10s: (89.25...160.95)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Overflow : 111.20...194.60  
quantity cm<sup>3</sup>/10s: (96.20...209.60)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 475  
LDA-stroke mm: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.00...64.00  
1000S.: (59.50...67.50)

2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1480  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 54.00...60.00  
1000S.: (51.00...63.00)

9th speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 66.00...69.00  
1000S.: (64.50...70.50)

10th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 69.50...72.50  
1000S.: (67.50...74.50)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quynntity cm<sup>3</sup>/: 73.50...74.50  
1000S.: (71.00...77.00)

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 50.50...51.50  
1000S.: (47.00...55.00)

20th speed 1/min: 500  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: -  
1000S.: (81,50...91,50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (5.00...15.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 50.00...110.00  
1000S.: (50.00...110.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
1000S.: (60.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: K-OT
MS	mm: 1,2...1,6
SVS max.	mm: 2,2
XK	mm: 21,8...23,8
XL	mm: 10,2...13,6

Remarks:

: C.D.C. # 391 6987

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W80  
Edition : 22.05.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R419  
Type number : 0 460 426 184  
Customer Part-No. : 391 8991

Customer-specific information  
Customer : CDC

Engine : 6 BTA 590A  
Speed 1/min: 1250

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.25  
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.60...2.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 85.00...86.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 59.50...60.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (6.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 12.00...16.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1325  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 75.00...81.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...160.00  
mind 1000S.: 80.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.30...3.10  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.60...2.00  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 450\*  
Charge press. hPa: -  
TD travel mm: 2.00...3.00 \*  
mm: (1.80...3.20) \*

Supply-pump pressure characteristic:

1st speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.30...6.90

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.40...8.00

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.90...4.50

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 440  
LDA-stroke mm: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 82.50...83.50  
1000s.: (79.00...87.00)

2nd speed 1/min: 1480  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

3rd speed 1/min: 1430  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000s.: (15.00...45.00)

5th speed 1/min: 1325  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.00...81.00  
1000s.: (72.00...84.00)

9th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 83.50...88.50  
1000s.: (82.00...90.00)

10th speed 1/min: 1050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 84.50...89.50  
1000s.: (83.00...91.00)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.00...86.00  
1000s.: (82.50...88.50)

18th speed 1/min: 500  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 59.50...60.50  
1000S.: (56.00...64.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...16.00  
1000S.: (9.00...19.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 460

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...160.00  
1000S.: (80.00...160.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...80.00  
1000S.: (50.00...80.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...160.00  
1000S.: (80.00...160.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,6...3,8  
KF mm: K-OT  
MS mm: 0,7...1,1

Remarks:

:  
:  
:  
Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W81  
Edition : 22.05.91  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE6/12F1250R372-2  
Type number : 0 460 426 185  
Customer Part-No. : 391 6948

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9 IND.

Power KW: -  
Speed 1/min: 1250

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42,00...50,00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm: 1,3  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.50...4.10  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/  
1000S.: 73.00...74.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 360  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/  
1000S.: 51.00...57.00

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 5.20...6.00  
mm: (4.90...6.30)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 750



TD travel mm: 3.40...3.80  
 mm: (2.90...4.30)  
 Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 500  
 TD travel mm: 1.30...2.10  
 mm: (1.00...2.40)  
 Shutoff  
 electromagnet Volt: 24  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump  
 pressure bar: 2.40...3.00  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 750  
 Supply-pump  
 pressure bar: 3.50...4.10  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1100  
 Supply-pump  
 pressure bar: 4.80...5.40  
 Shutoff  
 electromagnet Volt: 24  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26,70...98.40)  
 2nd speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1400  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1350  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
 1000S.: (15.00...55.00)  
 5th speed 1/min: 1300  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 51.00...57.00  
 1000S.: (48.00...60.00)  
 9th speed 1/min: 1250

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 68.50...71.50  
 1000S.: (67.00...73.00)  
 10th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 74.50...78.50  
 1000S.: (72.50...80.50)  
 11th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 75.00...79.00  
 1000S.: -  
 12th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 73.00...74.00  
 1000S.: (70,50...76,50)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 64.00...72.00  
 1000S.: (62.00...74.00)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 360  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 360  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 8.00...14.00  
 1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)

2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...130.00  
1000S.: (70.00...130.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: (30.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5,0...5,4
MS	mm: 0,6...1,0
SVS max.	mm: 1,3
XK	mm: 18,8...20,8
XL	mm: 11,1...14,5

Remarks:

:

Values without check tolerance do  
not apply when checking pump.

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W82  
Edition : 22.05.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R419-1  
Type number : 0 460 426 186  
Customer Part-No. : 391 3442

Customer-specific information  
Customer : CDC

Engine : 6 BTA 590A

Power KW: 118  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.25  
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.60...2.00  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 85.00...86.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 59.50...60.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (6.0)

## Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 12.00...16.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1325  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 75.00...81.00

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...160.00  
mind 1000S.: 80.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.30...3.10  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.60...2.00  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 450\*  
Charge press. hPa: -  
TD travel mm: 2.00...3.00 \*  
mm: (1.80...3.20) \*

Supply-pump pressure characteristic:

1st speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.30...6.90

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.40...8.00

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.90...4.50

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 440  
LDA-stroke mm: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 82.50...83.50  
1000S.: (79.00...87.00)

2nd speed 1/min: 1480  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1430  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 15.00...45.00  
1000S.: (15.00...45.00)

5th speed 1/min: 1325  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 75.00...81.00  
1000S.: (72.00...84.00)

9th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 83.50...88.50  
1000S.: (82.00...90.00)

10th speed 1/min: 1050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 84.50...89.50  
1000S.: (83.00...91.00)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>: 85.00...86.00  
1000S.: (82.50...88.50)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 59.50...60.50  
1000S.: (56.00...64.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...16.00  
1000S.: (9.00...19.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 460  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...160.00  
1000S.: (80.00...160.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...80.00  
1000S.: (50.00...80.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...160.00  
1000S.: (80.00...160.00)

K03

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,6...3,8  
KF mm: K-OT  
MS mm: 0,7...1,1

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Unscrew KSB ball valve 2 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 15,8 c2  
 Edition : 21.06.91  
 Replaces : 3.6.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 649 188  
 Injection pump  
 Pump designation : PE10A95D610/4LS2452  
 EP type number : 0 410 699 998  
 Governor  
 Governor design. : RQV300...1150AB988DL  
 Governor no. : 0 420 214 229

Customer-spec. information  
 Customer : KHD

Engine : F10L413F

1st version kW : 216.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 10- 9- 4- 3- 6-  
 5- 8- 7- 2

Phasing : 0-27-72-99-144-171-  
 216-243-288-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 9.1...9.2

100 s: (8.9...9.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.2

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.60

2nd speed rpm : 340  
 travel mm : 1.60...2.10

3rd speed rpm : 710  
 travel mm : 3.70...4.20

4th speed rpm : 1200  
 travel mm : 8.60...9.10

5th speed rpm : 1390  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 91.5...92.5

1000 : (89.5...94.5)

Spread cm<sup>3</sup> : 3.00  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 9.00  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1235...1265  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 80...88

#### Testing:

Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Speed rpm : 750  
Maximum rack travel: 1.00

#### CONSTANT REGULATION

Speed rpm : 320...390

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 975  
Rack travel in m: 10.20...10.40  
3rd speed rpm : 700  
Rack travel in m: 10.50...10.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 90.0...93.0  
1000 s: (87.5...95.5)

#### RACK STOP ADJUSTMENT

Speed rpm : 600

#### BREAKAWAY

K05

1st version  
1mm rack travel less than

full load rack tr: 9.00  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.00...7.20  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : HAN 10,8 h1  
Edition : 21.06.91  
Replaces : 25.10.88  
Test oil : ISO-4113

Combination no. : 0 400 676 186

Injection pump  
Pump designation : PE6A95D32ORS2557  
EP type number : 0 410 696 986  
Governor  
Governor design. : RSV400...1100A8C1117  
-1R  
Governor no. : 0 420 233 205

Customer spec. information  
Customer : HANOMAG

Engine : D963N

1st version kW : 110.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
: (2.10...2.30)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 8.0...8.2

Del.quantity cm3/ : 3.1...3.9

100 s: (2.8...4.1)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 104...112

Testing:

1st rack travel in: 8.90

Speed rpm : 1140...1150

2nd rack travel in: 4.00



Speed rpm : 1160...1190  
3rd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1365  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 7.6

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 400  
Rack travel in mm : 8.00...8.20  
Rack travel in mm : 2.00  
Speed rpm : 585...645

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 500  
Rack travel in m: 10.70...10.80  
4th speed rpm : 865  
Rack travel in m: 10.30...10.50

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 79.0...82.0  
1000 s: (76.5...84.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.90  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 122.0...132.0  
1000 s: (119.0...135.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 a 2  
 Edition : 26.07.91  
 Replaces : 11.7.88  
 Test oil : ISO-4113  
 Combination no. : 0 400 844 088  
 Injection pump  
 Pump designation : PES4A90D410RS2666  
 EP type number : 0 410 894 029  
 Governor  
 Governor design. : RQV300...1400AB1065-  
 10L  
 Governor no. : 0 420 212 203

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM364

1st version kW : 66.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 6.3...6.4

100 s: (6.1...6.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.4)

2nd speed rpm : 300.0

Rack travel in mm : 8.6...8.8

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 63.5...64.5

1000 : (61.5...66.5)

Spread cm<sup>3</sup> : 3.00

1000 : (4.50)

## RATED SPEED

1st version

Control lever

position degrees: 111...119

Testing:

1st rack travel in: 9.90

Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1545...1575  
4th rack travel in: 1700  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80

Testing:  
Speed rpm : 100  
Minimum rack trave: 10.20  
Speed rpm : 300  
Rack travel in mm : 8.60...8.80

CONSTANT REGULATION  
Speed rpm : 540...680

TORQUE CONTROL  
Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 500  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 700  
Rack travel in m: 11.70...12.00  
4th speed rpm : 900  
Rack travel in m: 11.30...11.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 50.0...53.0  
1000 s: (47.5...55.5)  
1000 s: (5.)  
Speed rpm : 900  
Del.quantity cm3/ : 52.5...55.5  
1000 s: (50.0...58.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1440...1450

#### STARTING FUEL DELIVERY

Speed rpm : 100

K09

Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 16.60...17.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 w 3  
 Edition : 18.06.91  
 Replaces : 5.10.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 578  
 Injection pump  
 Pump designation : PES6A95D32ORS2779  
 EP type number : 0 410 896 903  
 Governor  
 Governor design. : RQV350...1200AB1236-7R  
 Governor no. : 0 420 213 119

Customer-spec. information  
 Customer : NAVISTAR

Engine : DT 466

1st version kW : 145.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 110

Opening  
 pressure, bar : 250...253

Orifice plate  
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

K10

Prestroke mm : 2.65...2.75  
 : (2.60...2.80)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1400

travel mm : 8.60...9.00

2nd speed rpm : 1250

travel mm : 7.30...7.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 900

Del.quantity : 101.5...103.5

1000 : (99.5...105.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 41...49

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1230...1260  
2nd rack travel in: 4.00  
Speed rpm : 1385...1395  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 225  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 500  
Rack travel in m: 12.50...12.90

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.5...78.5  
1000 s: (72.5...80.5)

BREAKAWAY

K11

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1230...1260

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (15.0...23.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: NAVISTAR #1815517C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 y  
Edition : 18.06.91  
Replaces : 15.11.90  
Test oil : ISO-4113

Combination no. : 0 400 846 579

Injection pump  
Pump designation : PES6A95D32ORS2779  
EP type number : 0 410 896 903  
Governor  
Governor design. : RQV350...1350AB1248-  
R  
Governor no. : 0 420 213 120

Customer-spec. information  
Customer : NAVISTAR

Engine : DT 360

1st version kW : 126.0  
Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 110

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75  
: (2.60...2.80)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1350  
Rack travel in mm : 12.30...12.40  
Del.quantity cm3/ : 8.4...8.6  
100 s: (8.2...8.8)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 5.9...6.1  
Del.quantity cm3/ : 1.7...2.1  
100 s: (1.5...2.3)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 7.30...7.50  
2nd speed rpm : 1460  
travel mm : 8.10...8.50  
3rd speed rpm : 550  
travel mm : 3.10...3.70  
4th speed rpm : 350  
travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1350  
Aneroid pressure h: 900  
Del.quantity : 84.0...86.0  
1000 : (82.0...88.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1390...1420  
2nd rack travel in: 4.00  
Speed rpm : 1525...1535  
4th rack travel in: 1625  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.40  
2nd pressure hPa : 240  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 435  
Rack travel in m: 11.50...11.90

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 61.5...65.5  
1000 s: (59.5...67.5)

BREAKAWAY

K13

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1390...1420

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (15.0...23.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: NAVISTAR #1816726C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 y1  
 Edition : 18.06.91  
 Replaces : 8.6.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 580  
 Injection pump  
 Pump designation : PES6A95D32ORS2779  
 EP type number : 0 410 896 903  
 Governor  
 Governor design. : RQV350...1350AB1248-1R  
 Governor no. : 0 420 213 121

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA 360

1st version kW : 138.0  
 Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 110

Opening  
 pressure, bar : 250...253

Orifice plate  
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75  
 : (2.60...2.80)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1350  
 Rack travel in mm : 12.30...12.40  
 Del.quantity cm3/ : 8.4...8.6  
 100 s: (8.2...8.8)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm3/ : 1.7...2.1  
 100 s: (1.5...2.3)  
 Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 7.30...7.50  
 2nd speed rpm : 1460  
 travel mm : 8.10...8.50  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1350  
 Aneroid pressure h: 900  
 Del.quantity : 84.0...86.0  
 1000 : (82.0...88.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1390...1420  
2nd rack travel in: 4.00  
Speed rpm : 1525...1535  
4th rack travel in: 1625  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 215  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 430  
Rack travel in m: 11.30...11.70

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 67.0...71.0  
1000 s: (65.0...73.0)

BREAKAWAY

K15

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1390...1420

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (15.0...23.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: NAVISTAR #1816728C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 s  
Edition : 26.07.91  
Replaces : 24.4.91  
Test oil : ISO-4113

Combination no. : 0 400 846 582

Injection pump  
Pump designation : PES6A95D32ORS2796  
EP type number : 0 410 896 901  
Governor  
Governor design. : RQ300/1300AB1253-2R  
Governor no. : 0 420 201 653

Customer-spec. information  
Customer : DAF

Engine : NS 156G

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 8.4...8.5

100 s: (8.2...8.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.6...1.0

100 s: (0.3...1.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 770

Rack travel in mm : 7.50...8.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 84.5...85.5

1000 : (82.5...87.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 770

Rack travel in mm : 8.0

Testing:

1st rack travel in: 11.60

Speed rpm : 1325...1340

2nd rack travel in: 4.00

Speed rpm : 1410...1440

4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 545...585

#### TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 750  
Rack travel in m: 14.20...14.80  
3rd speed rpm : 960  
Rack travel in m: 13.50...14.10  
4th speed rpm : 1055  
Rack travel in m: 12.90...13.30

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.80...12.90

##### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.80...11.00  
2nd pressure hPa : 260  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 210  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1290  
Del.quantity cm3/ : 87.0...89.0  
1000 s: (84.5...91.5)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 44.5...45.5  
1000 s: (42.5...47.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1325...1340

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 6.0...10.0  
1000 s: (3.5...12.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 p 3  
Edition : 02.08.91  
Replaces : 5.11.90  
Test oil : ISO-4113

Combination no. : 0 400 846 583

Injection pump  
Pump designation : PES6A95D32ORS2693  
EP type number : 0 410 896 914  
Governor  
Governor design. : RQ300/1300AB1253R  
Governor no. : 0 420 201 649

Customer-spec. information  
Customer : DAF

Engine : NS 156

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 8.7...8.8

100 s: (8.5...9.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 0.6...1.0

100 s: (0.3...1.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 850

Rack travel in mm : 7.50...8.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 700

Del.quantity : 87.5...88.5

1000 : (85.5...90.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 850

Rack travel in mm : 8.0

Testing:

1st rack travel in: 11.00

Speed rpm : 1335...1350

2nd rack travel in: 4.00

Speed rpm : 1430...1460

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.4

#### Testing:

Speed rpm : 100

Minimum rack trave: 7.70

Speed rpm : 300

Rack travel in mm : 6.40...6.50

Rack travel in mm : 2.00

Speed rpm : 540...580

#### TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1280

Rack travel in m: 12.30...12.40

2nd speed rpm : 1000

Rack travel in m: 12.30...12.50

#### Aneroid/Altitude

Compensator Test

#### 1st version

Setting

Speed rpm : 600

Pressure hPa : 700

Rack travel mm : 12.00...12.10

#### Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 290

Rack travel in m: 11.50...11.60

3rd pressure hPa : 250

Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm3/ : 53.5...54.5

1000 s: (51.5...56.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 1335...1350

#### LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.30...6.50

Del.quantity cm3/ : 6.0...10.0

1000 s: (3.5...12.5)

Spread

cm3 : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 p 4  
Edition : 26.07.91  
Replaces : 24.4.91  
Test oil : ISO-4113

Combination no. : 0 400 846 585

Injection pump  
Pump designation : PES6A95D32ORS2693  
EP type number : 0 410 896 914  
Governor  
Governor design. : RQ300/1300AB1253-1R  
Governor no. : 0 420 201 650

Customer-spec. information  
Customer : DAF

Engine : NS 133

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 7.6...7.7

100 s: (7.4...7.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 0.6...1.0

100 s: (0.3...1.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 725

Rack travel in mm : 7.50...8.50

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity : 76.5...77.5

1000 : (74.5...79.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 725

Rack travel in mm : 8.0

### Testing:

1st rack travel in: 9.50

Speed rpm : 1335...1350

2nd rack travel in: 4.00

Speed rpm : 1410...1440

4th rack travel in: 1550

Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.4

#### Testing:

Speed rpm : 100

Minimum rack trave: 7.70

Speed rpm : 300

Rack travel in mm : 6.30...6.50

Rack travel in mm : 2.00

Speed rpm : 525...565

#### TORQUE CONTROL

Dimension a mm : 0.55

Torque control curve - 1st version

1st speed rpm : 1290

Rack travel in m: 10.50...10.60

2nd speed rpm : 800

Rack travel in m: 11.80...12.40

3rd speed rpm : 950

Rack travel in m: 11.20...11.80

4th speed rpm : 1050

Rack travel in m: 10.70...11.10

#### Aneroid/Altitude

##### Compensator Test

#### 1st version

##### Setting

Speed rpm : 600

Pressure hPa : 700

Rack travel mm : 11.50...11.60

##### Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.10...10.30

2nd pressure hPa : 160

Rack travel in m: 10.70...10.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 1290

Del.quantity cm<sup>3</sup>/ : 73.0...75.0

1000 s: (70.5...77.5)

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 50.5...51.5

1000 s: (48.5...53.5)

#### BREAKAWAY

#### 1st version

K21

1mm rack travel less than

full load rack tr: 9.50

Speed rpm : 1335...1350

#### LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.30...6.50

Del.quantity cm<sup>3</sup>/ : 6.0...10.0

1000 s: (3.5...12.5)

Spread cm<sup>3</sup> : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 p 5  
Edition : 21.06.91  
Replaces : 24.4.91  
Test oil : ISO-4113

Combination no. : 0 400 846 586

Injection pump  
Pump designation : PES6A95D32ORS2693  
EP type number : 0 410 896 914  
Governor  
Governor design. : RQ300/1300AB1254R  
Governor no. : 0 420 201 651

Customer-spec. information  
Customer : DAF

Engine : NT 119

1st version kW : 119.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 7.50...10.50

K22

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 6.1...6.2

100 s: (5.9...6.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 0.6...1.0

100 s: (0.3...1.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 850

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 61.5...62.5

1000 : (59.5...64.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 850

Rack travel in mm : 20.0



Testing:

1st rack travel in: 9.30  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1410...1440

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:

Speed rpm : 100  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 525...565

TORQUE CONTROL

Dimension a mm : 0.35  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 850  
Rack travel in m: 11.10...11.40  
3rd speed rpm : 975  
Rack travel in m: 10.70...11.00  
4th speed rpm : 1025  
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1290  
Del.quantity cm<sup>3</sup>/ : 68.0...70.0  
1000 s: (65.5...72.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1340...1350

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 6.0...10.0  
1000 s: (3.5...12.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RAB 9,7 e  
Edition : 26.07.91  
Replaces : 22.3.91  
Test oil : ISO-4113

Combination no. : 0 400 846 588

Injection pump  
Pump designation : PES6A95D420LS2804  
EP type number : 0 410 896 899  
Governor  
Governor design. : RQ200/1050AB1246-1R  
Governor no. : 0 420 201 652

Customer-spec. information  
Customer : RABA

Engine : D2156 HM6 UT

1st version kW : 162.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.80...1.90  
: (1.75...1.95)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 11.9...12.1

100 s: (11.7...12.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 200.0

Rack travel in mm : 7.4...7.6

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 500

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 119.0...121.0

1000 : (117.0...123.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 500

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.00

Speed rpm : 1095...1110

2nd rack travel in: 4.00

Speed rpm : 1125...1155

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 200

Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100

Minimum rack trave: 8.00

Speed rpm : 200

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 280...320

#### TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 12.00...12.10

2nd speed rpm : 415

Rack travel in m: 13.10...13.50

3rd speed rpm : 680

Rack travel in m: 12.70...13.10

4th speed rpm : 835

Rack travel in m: 12.20...12.70

#### Aneroid/Altitude

Compensator Test

#### 1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 12.70...12.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.70...10.80

2nd pressure hPa : 260

Rack travel in m: 12.50...12.60

3rd pressure hPa : 180

Rack travel in m: 11.10...11.40

#### START CUT-OUT

Speed 1/min : 140 (160)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 600

Del.quantity cm3/ : 113.0...116.0

1000 s: (110.5...118.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 74.0...76.0

1000 s: (72.0...78.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 500

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 150.0...160.0

1000 s: (147.0...163.0)

Rack travel in mm : 17.50...17.70

Remarks:

:

Set idle stop at 200 min -1 to a  
control-rod travel of 6.5 mm

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 j 5  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 593  
 Injection pump  
 Pump designation : PES6A95D410RS2797  
 EP type number : 0 410 896 900  
 Governor  
 Governor design. : RQV300...1200AB1065-25L  
 Governor no. : 0 420 212 229

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kW : 92.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 5.8...6.0

100 s: (5.6...6.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.6...9.0

Del.quantity cm3/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 58.5...60.5

1000 : (56.5...62.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 8.90  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1360...1390  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 73...81

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.60  
Speed rpm : 300  
Rack travel in mm : 8.60...9.00

CONSTANT REGULATION  
Speed rpm : 525...625

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 500  
Rack travel in m: 10.70...10.90  
4th speed rpm : 840  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 44.0...47.0  
1000 s: (41.5...49.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack travel: 8.90  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100

K27

Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 14.60...15.00

Remarks:

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 j 6  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 594  
 Injection pump  
 Pump designation : PES6A95D410RS2797  
 EP type number : 0 410 896 900  
 Governor  
 Governor design. : RQV300...1400AB1065-26L  
 Governor no. : 0 420 212 230

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kW : 95.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 5.8...6.0

100 s: (5.6...6.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 9.0...9.2

Del.quantity cm3/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 58.0...60.0

1000 : (56.0...62.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control Lever  
position degrees: 109...117

Testing:

1st rack travel in: 8.90  
Speed rpm : 1450...1460  
2nd rack travel in: 4.00  
Speed rpm : 1545...1575  
4th rack travel in: 1670  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 71...79

Testing:

Speed rpm : 100  
Minimum rack trave: 10.50  
Speed rpm : 300  
Rack travel in mm : 9.00...9.20

CONSTANT REGULATION

Speed rpm : 500...650

TORQUE CONTROL

Dimension a mm : 1.40  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 400  
Rack travel in m: 11.30...11.60  
3rd speed rpm : 650  
Rack travel in m: 10.90...11.10  
4th speed rpm : 900  
Rack travel in m: 10.40...10.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 400  
Del.quantity cm3/ : 48.0...51.0  
1000 s: (45.5...53.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.90  
Speed rpm : 1450...1460

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 14.60...15.00

Remarks:

:

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 3,0 d  
Edition : 21.06.91  
Replaces : 28.11.88  
Test oil : ISO-4113

Combination no. : 0 400 863 013

Injection pump  
Pump designation : PES3A90D410/3RS2740  
EP type number : 0 410 893 006  
Governor  
Governor design. : RSV325...1150A0C2219

Governer no. : 0 420 232 466

Customer-spec. information  
Customer : KHD

Engine : F3L913G

1st version kW : 36.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
: (2.45...2.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 2

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 5.2...5.3

100 s: (5.0...5.5)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 375.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.1...1.7

100 s: (0.9...1.9)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650

Del.quantity : 52.0...53.0

1000 : (50.0...55.0)

Spread cm3 : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 107...115

Testing:

1st rack travel in: 8.10

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1120...1150

3rd rack travel in: 4.00



Speed rpm : 1135...1165  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 375  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 495...555

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 650  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 350  
Rack travel in m: 9.30...9.60  
3rd speed rpm : 1050  
Rack travel in m: 9.10...9.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 350  
Del.quantity cm3/ : 45.0...47.0  
1000 s: (42.5...49.5)  
Speed rpm : 1050  
Del.quantity cm3/ : 63.5...65.5  
1000 s: (61.0...68.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 57.0...67.0  
1000 s: (54.0...70.0)  
Rack travel in mm : 10.70...10.90

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 43  
 Edition : 02.08.91  
 Replaces : 4.5.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 864 074  
 Injection pump  
 Pump designation : PES4A85D410/3RS2638  
 EP type number : 0 410 884 950  
 Governor  
 Governor design. : RSV325..1150AOC2168-4L  
 Governor no. : 0 420 232 524

Customer-spec. information  
 Customer : KHD

Engine : BF4L913T

1st version kW : 60.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 7.1...7.2

100 s: (6.9...7.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 8.8...9.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.4...2.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 71.5...72.5

1000 : (69.5...74.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 101...109

Testing:

1st rack travel in: 10.40

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1270...1300

3rd rack travel in: 4.00

Speed rpm : 1330...1360  
4th rack travel in: 1500  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 8.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 8.80...9.00  
Rack travel in mm : 2.00  
Speed rpm : 720...780

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 500  
Rack travel in m: 12.50...12.60  
3rd speed rpm : 940  
Rack travel in m: 11.90...12.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 71.5...73.5  
1000 s: (69.0...76.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...135.0  
1000 s: (122.0...138.0)  
Rack travel in mm : 19.50...21.00

Remarks:

: DX3X

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 4,1 b 6  
Edition : 26.07.91  
Replaces : 3.6.91  
Test oil : ISO-4113

Combination no. : 0 400 864 092

Injection pump  
Pump designation : PES4A90D320/3RS2659  
EP type number : 0 410 894 028  
Governor  
Governor design. : RSV325...1250A5C2182  
-9R

Governer no. : 0 420 233 287

Customer-spec. information  
Customer : MWM

Engine : TD226B-4

1st version kW : 87.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
: (2.90...3.10)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.50...4.50

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 9.1...9.2

100 s: (8.9...9.4)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0  
Rack travel in mm : 6.9...7.1  
Del.quantity cm3/ : 0.8...1.4  
100 s: (0.6...1.6)  
Spread cm3 : 0.2  
100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1250

Areroid pressure h: 700

Del.quantity : 91.5...92.5

1000 : (89.5...94.5)

Spread cm3 : 3.00

1000 : (5.00)

## RATED SPEED

### 1st version

Control Lever

position degrees: 103...111

Testing:

1st rack travel in: 10.50

Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
3rd rack travel in: 4.00  
Speed rpm : 1355...1385  
4th rack travel in: 1520  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 445...505

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 500  
Rack travel in m: 12.50...12.60  
3rd speed rpm : 920  
Rack travel in m: 11.90...12.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.50...12.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 185  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 90  
Rack travel in m: 11.00...11.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 700  
Del.quantity cm3/ : 98.5...100.5  
1000 s: (96.0...103.0)

Aneroid pressure h: 85  
Speed rpm : 500  
Del.quantity cm3/ : 79.0...81.0  
1000 s: (76.5...83.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 61.0...63.0  
1000 s: (59.0...65.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 132.0...142.0  
1000 s: (129.0...145.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 4,1 b 7  
Edition : 26.07.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 400 864 093

Injection pump  
Pump designation : PES4A90D320/3RS2659  
EP type number : 0 410 894 028  
Governor  
Governor design. : RSV325...1250A5C505-4R  
Governor no. : 0 420 233 288

Customer-spec. information  
Customer : MWM

Engine : D226-B4

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
: (2.90...3.10)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.50...4.50

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 9.0...9.1

100 s: (8.8...9.3)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.2...7.4

Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1250

Del.quantity : 90.0...91.0

1000 : (88.0...93.0)

Spread cm3 : 3.00

1000 : (5.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 105...113

Testing:

1st rack travel in: 11.00

Speed rpm : 1290...1300

2nd rack travel in: 4.00  
Speed rpm : 1340...1370  
3rd rack travel in: 4.00  
Speed rpm : 1360...1390  
4th rack travel in: 1520  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 440...500

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 500  
Rack travel in m: 12.00...12.20

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 6,2 e 4  
Edition : 21.06.91  
Replaces : 31.8.90  
Test oil : ISO-4113

Combination no. : 0 400 866 112

Injection pump  
Pump designation : PES6A90D320/3RS2660  
EP type number : 0 410 896 078  
Governor  
Governor design. : RSV325...1500A2C505-2R  
Governor no. : 0 420 233 196

Customer-spec. information  
Customer : MWM

Engine : D226-6

1st version kW : 110.0  
Rated speed : 3000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
: (2.90...3.10)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 3.50...4.50

## BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 8.9...9.0

100 s: (8.7...9.2)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0  
Rack travel in mm : 7.0...7.2  
Del.quantity cm3/ : 0.8...1.4  
100 s: (0.6...1.6)  
Spread cm3 : 0.2  
100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Del.quantity : 89.5...90.5

1000 : (87.5...92.5)

Spread cm3 : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 107...115



Testing:

1st rack travel in: 10.20  
Speed rpm : 1540...1550  
2nd rack travel in: 4.00  
Speed rpm : 1590...1620  
3rd rack travel in: 4.00  
Speed rpm : 1605...1635  
4th rack travel in: 1780  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 68...76

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 6.6

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.00...7.20  
Rack travel in mm : 2.00  
Speed rpm : 460...520

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1500

Rack travel in m: 11.20...11.30

2nd speed rpm : 500

Rack travel in m: 11.20...11.40

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20

Speed rpm : 1540...1550

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a63  
Edition : 08.07.91  
Replaces : 18.2.91  
Test oil : ISO-4113

Combination no. : 0 400 866 132

Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV500...1250A0C2190  
-28R  
Governor no. : 0 420 233 231

Customer spec. information  
Customer : C.D.C.

Engine : 6 CT-I 8.3ltr.

1st version kW : 139.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 10.2...10.4

100 s: (10.0...10.6)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.3...1.7  
100 s: (1.0...1.9)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 102.5...104.5

1000 : (100.5...106.5)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 10.40

Speed rpm : 1315...1325

2nd rack travel in: 4.00

Speed rpm : 1365...1375  
3rd rack travel in: 4.00  
Speed rpm : 1365...1395  
4th rack travel in: 1450  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 5.1

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 500  
Rack travel in mm : 5.50...5.70

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1315...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 6.00  
1000 s: (8.00)

Remarks:  
: C.D.C. # 3915687

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a66  
Edition : 08.07.91  
Replaces : 18.2.91  
Test oil : ISO-4113

Combination no. : 0 400 866 140

Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV400...1100AOC2190  
-33R  
Governor no. : 0 420 233 237

Customer-spec. information  
Customer : C.D.C.

Engine : 6 CTA 8.3ltr

1st version kW : 174.5  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 12.8...13.0

100 s: (12.6...13.2)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.4...1.8

100 s: (1.2...2.1)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 128.0...130.0

1000 : (126.0...132.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
3rd rack travel in: 4.00  
Speed rpm : 1205...1235  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.50...5.70

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 14.5...18.5  
1000 s: (12.0...21.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3915967

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L10  
Edition : 08.07.91  
Replaces : 14.12.90  
Test oil : ISO-4113

Combination no. : 0 400 866 148

Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV415..1175AOC2190-43R  
Governor no. : 0 420 233 249

Customer spec. information  
Customer : C.D.C

Engine : 6 CT

1st version kW : 129.0  
Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
(2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 415.0  
Rack travel in mm : 5.1...5.3  
Del.quantity cm3/ : 1.5...1.9  
100 s: (1.2...2.1)  
Spread cm3 : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1175  
Del.quantity : 96.0...98.0  
1000 : (94.0...100.0)  
Spread cm3 : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:

1st rack travel in: 9.40  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1295...1325  
3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 32...40  
Setting point w/out bumper spring  
Speed rpm : 415  
Rack travel in mm : 4.7

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 415  
Rack travel in mm : 5.10...5.30

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 800  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 415  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 15.0...19.0  
1000 s: (12.5...21.5)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:  
: C.D.C # 3919459

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L13  
Edition : 08.07.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 866 149  
Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV375...1000A0C2190  
-44R  
Governor no. : 0 420 233 250

Customer-spec. information  
Customer : C.D.C.

Engine : 6 CTA

1st version kW : 166.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 13.2...13.4

100 s: (13.0...13.6)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 375.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm3/ : 1.4...1.8  
100 s: (1.1...2.0)  
Spread cm3 : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Del.quantity : 132.5...134.5  
1000 : (130.5...136.5)  
Spread cm3 : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 37...45

Testing:



1st rack travel in: 11.90  
Speed rpm : 1050...1060  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
3rd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1200  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 375  
Rack travel in mm : 5.30...5.50

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 750  
Rack travel in m: 13.60...13.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 141.5...145.5  
1000 s: (139.5...147.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1050...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3915570

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 l 8  
Edition : 08.07.91  
Replaces : 2.5.90  
Test oil : ISO-4113

Combination no. : 0 400 866 150

Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV400...1100A0C2190  
-45R  
Governor no. : 0 420 233 253

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT 8.3

1st version kW : 134.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 375.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 2.3...2.7  
100 s: (2.0...2.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 101.5...103.5

1000 : (99.5...105.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 51...59

Testing:

1st rack travel in: 9.90  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1230...1240  
3rd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 31...39  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 375  
Rack travel in mm : 5.90...6.10

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 750  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 114.5...118.5  
1000 s: (112.5...120.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack travel: 9.90  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 23.0...27.0  
1000 s: (20.5...29.5)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3915974

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 p  
Edition : 08.07.91  
Replaces : 13.5.91  
Test oil : ISO-4113

Combination no. : 0 400 866 153

Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV400...950AOC2238-1R  
Governor no. : 0 420 233 255

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT 8.3

1st version kW : 145.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 5.2...5.4  
Del.quantity cm3/ : 1.3...1.7  
100 s: (1.0...1.9)  
Spread cm3 : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 950  
Aneroid pressure h: 900  
Del.quantity : 120.5...122.5  
1000 : (118.5...124.5)  
Spread cm3 : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 37...45

Testing:

1st rack travel in: 11.10  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1075  
3rd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.10...12.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 220  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 305  
Rack travel in m: 11.40...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 89.5...93.5  
1000 s: (87.5...95.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: C.D.C # 3917577

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a77  
Edition : 08.07.91  
Replaces : 10.4.91  
Test oil : ISO-4113

Combination no. : 0 400 866 160

Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV470...1100AOC2190  
-48R  
Governor no. : 0 420 233 262

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT830

1st version kW : 150.6  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 470.0  
Rack travel in mm : 5.7...5.9  
Del.quantity cm3/ : 1.6...2.0  
100 s: (1.4...2.3)  
Spread cm3 : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 115.0...117.0

1000 : (113.0...119.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 48...56

Testing:

1st rack travel in: 11.10  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1235...1245  
3rd rack travel in: 4.00  
Speed rpm : 1235...1265  
4th rack travel in: 1325  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 26...34  
Setting point w/out bumper spring  
Speed rpm : 470  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 470  
Rack travel in mm : 5.70...5.90

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 750  
Rack travel in m: 13.00...13.40

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 128.0...132.0  
1000 s: (126.0...134.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 470  
Rack travel in mm : 5.70...5.90  
Del. quantity cm<sup>3</sup>/ : 16.5...20.5  
1000 s: (14.0...23.0)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3917962

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a83  
Edition : 08.07.91  
Replaces : 5.10.90  
Test oil : ISO-4113

Combination no. : 0 400 866 167

Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV400...1100A0C2190  
-50R  
Governor no. : 0 420 233 276

Customer spec. information  
Customer : C.D.C.

Engine : 6 CT 8.3

1st version kW : 138.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
(2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 10.9...11.1

100 s: (10.7...11.3)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 5.7...5.9  
Del.quantity cm3/ : 1.7...2.1  
100 s: (1.4...2.3)  
Spread cm3 : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del.quantity : 109.5...111.5  
1000 : (107.5...113.5)  
Spread cm3 : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 48...56

Testing:



1st rack travel in: 10.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 27...35  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.70...5.90

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 750  
Rack travel in m: 12.60...12.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 127.5...131.5  
1000 s: (125.5...133.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 17.0...21.0  
1000 s: (14.5...23.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3919497

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a84  
 E. tion : 08.07.91  
 Replaces : 18.2.91  
 Test oil : ISO-4113

Combination no. : 0 400 866 168

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 021  
 Governor  
 Governor design. : RSV400...1100A0C2190  
 -52R  
 Governor no. : 0 420 233 278

Cust. part no. : 3917456

Customer-spec. information  
 Customer : C.D.C.

Engine : 6 CTA 8.3ltr

1st version kW : 174.5  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00x2.00x600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 12.7...12.9

100 s: (12.5...13.1)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.8...6.0

Del.quantity cm3/ : 1.7...2.1

100 s: (1.4...2.3)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 127.0...129.0

1000 : (125.0...131.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 39...47

Testing:

1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1210...1220  
3rd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.80...6.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 155.0...175.0  
1000 s: (150.0...180.0)  
Rack travel in mm : 16.20...16.40

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.80...6.00  
Del.quantity cm<sup>3</sup>/ : 17.0...21.0  
1000 s: (14.5...23.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: C.D.C # 3917456

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a96  
 Edition : 08.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 170  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100AOC2190  
 -53R  
 Governor no. : 0 420 233 284

Customer-spec. information  
 Customer : C.D.C.

Engine : 6 CT 8.3ltr

1st version kW : 173.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

MO2

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 425.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm3/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm3 : 0.6  
 100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del.quantity : 98.0...100.0  
 1000 : (96.0...102.0)  
 Spread cm3 : 4.00  
 1000 : (6.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 43...51

Testing:

1st rack travel in: 9.70  
Speed rpm : 1170...1180  
2nd rack travel in: 4.00  
Speed rpm : 1235...1245  
3rd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 5.30...5.50

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.70  
Speed rpm : 1170...1180

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3919767

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a93  
 Edition : 08.07.91  
 Replaces : 13.5.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 171  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1050AOC2190  
 -54R  
 Governor no. : 0 420 233 285

Customer-spec. information  
 Customer : C.D.C

Engine : 6 CT 8.3  
 1st version kW : 154.4  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

MD4

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 12.40...12.50  
 Del.quantity cm3/ : 12.5...12.7  
 100 s: (12.3...12.9)  
 Spread cm3 : 0.4  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.5...5.7  
 Del.quantity cm3/ : 1.5...1.9  
 100 s: (1.3...2.2)  
 Spread cm3 : 0.6  
 100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Del.quantity : 125.5...127.5  
 1000 : (123.5...129.5)  
 Spread cm3 : 4.00  
 1000 : (6.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 38...46

Testing:

1st rack travel in: 11.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
3rd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1275  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.50...5.70

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack travel: 11.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 15.5...19.5  
1000 s: (13.0...22.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3919768

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a94  
 Edition : 08.07.91  
 Replaces : 13.5.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 172  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1250AOC2190  
 -55R  
 Governor no. : 0 420 233 286

Customer-spec. information  
 Customer : C.D.C.

Engine : 6 CTA 8.3

1st version kW : 131.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 10.3...10.5

100 s: (10.1...10.7)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.2...1.6

100 s: (1.0...1.9)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 103.5...105.5

1000 : (101.5...107.5)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control Lever

position degrees: 51...59

Testing:



1st rack travel in: 9.90  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1360...1390  
4th rack travel in: 1450  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 26...34  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 12.5...16.5  
1000 s: (10.0...19.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C # 3920811

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 9  
 Edition : 26.07.91  
 Replaces : 31.7.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238C  
 Injection pump  
 Pump designation : PES4A95D41ORS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 T

1st version kW : 100.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 990

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 13.7...13.9  
 100 s: (13.5...14.1)

Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 415.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.1...1.7  
 100 s: (0.8...1.9)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 990  
 Del.quantity : 137.0...139.0  
 1000 : (135.0...141.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 93...101

Testing:

1st rack travel in: 13.20  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1225  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 415  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 415  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 410...470

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 990  
Rack travel in m: 14.20...14.30  
2nd speed rpm : 500  
Rack travel in m: 14.20...14.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm3/ : 129.5...132.5  
1000 s: (127.0...135.0)  
Speed rpm : 750  
Del.quantity cm3/ : 134.0...137.0  
1000 s: (131.5...139.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1030...1040

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 415  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 11.0...17.0  
1000 s: (8.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a11  
 Edition : 26.07.91  
 Replaces : 31.7.90  
 Test oil : ISO-4113

Combination no. : 0 400 874 238L

Injection pump  
 Pump designation : PES4A95D41ORS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 T

1st version kW : 100.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 990

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 415.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.1...1.7  
 100 s: (0.8...1.9)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 990

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 89...97

Testing:

1st rack travel in: 13.20  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1245  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 415  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 415  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 990  
Rack travel in mm : 14.20...14.30  
2nd speed rpm : 500  
Rack travel in mm : 14.20...14.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 129.5...132.5  
1000 s: (127.0...135.0)  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 134.0...137.0  
1000 s: (131.5...139.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 1030...1040

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 415  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 11.0...17.0  
1000 s: (8.5...19.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 d 6  
Edition : 18.06.91  
Replaces : 19.3.91  
Test oil : ISO-4113

Combination no. : 0 400 876 383

Injection pump  
Pump designation : PES6A100D410RS2762-1  
EP type number : 0 410 806 008  
Governor  
Governor design. : RSV400...1100A2C2204  
-8L  
Governor no. : 0 420 232 551

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6076TDW02

1st version kW : 128.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 190...200

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.95...3.05  
(2.90...3.10)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.70...10.80

Del.quantity cm<sup>3</sup>/ : 10.0...10.2

100 s: (9.8...10.4)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.8...6.0

Del.quantity cm<sup>3</sup>/ : 2.9...3.3

100 s: (2.7...3.5)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 100.5...102.5

1000 : (98.5...104.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever  
position degrees: 40...48

Testing:

1st rack travel in: 9.70  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1195...1205  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.80...6.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 700  
Rack travel in m: 12.60...12.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 131.5...135.5  
1000 s: (129.5...137.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0  
1000 s: (95.0...125.0)

LOW IDLE

Speed rpm : 400

M13

Rack travel in mm : 5.80...6.00  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (27.0...35.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47356  
Start-of-delivery mark = 13,5° after  
start of delivery cyl. 1.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 j 3  
Edition : 26.07.91  
Replaces : 18.2.91  
Test oil : ISO-4113

Combination no. : 0 400 876 388

Injection pump  
Pump designation : PES6A95D410RS2797  
EP type number : 0 410 896 900  
Governor  
Governor design. : RSV350...1200A1C1154  
-2L  
Governor no. : 0 420 232 561

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 366

1st version kW : 81.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
: (3.15...3.35)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.80...9.90

Del.quantity cm3/ : 5.4...5.6

100 s: (5.2...5.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 9.4...10.0

Del.quantity cm3/ : 0.8...1.4

100 s: (0.5...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 54.5...56.5

1000 : (52.5...58.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 108...116

## Testing:

1st rack travel in: 8.80

Speed rpm : 1240...1245

2nd rack travel in: 4.00

Speed rpm : 1263...1280

3rd rack travel in: 4.00



Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40  
5th rack travel in: 1255...1265  
Speed rpm : 8.80

Unimog

LOW IDLE 1  
Control lever  
position degrees: -3  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 9.70

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 9.40...10.00  
Rack travel in mm : 2.00  
Speed rpm : 495...555

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 500  
Rack travel in m: 11.10...11.30  
3rd speed rpm : 850  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm3/ : 48.0...51.0  
1000 s: (45.5...53.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.80  
Speed rpm : 1240...1245

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 92.0...102.0  
1000 s: (89.0...105.0)  
Rack travel in mm : 16.10...16.50

Remarks:

:

#### APPLICATION

M15

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 d 7  
Edition : 18.06.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 876 391  
Injection pump  
Pump designation : PES6A100D410RS2762-1  
EP type number : 0 410 806 008  
Governor  
Governor design. : RSV425...1100A2C2225  
-5L  
Governor no. : 0 420 232 566

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6076ARW-09

1st version kW : 145.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 2.95...3.05  
: (2.90...3.10)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 2.6...3.0

100 s: (2.4...3.2)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

### Testing:

1st rack travel in: 10.80  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

### LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 5.3

### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 5.70...5.90

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 650  
Rack travel in m: 13.70...13.90

Aneroid/Altitude  
Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.70...13.90

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 535  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 720  
Rack travel in m: 13.30...13.70

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 147.5...150.5  
1000 s: (145.0...153.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 129.0...133.0  
1000 s: (126.0...136.0)

### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1140...1150

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0  
1000 s: (95.0...125.0)

### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 26.0...30.0  
1000 s: (24.0...32.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

### Remarks:

: JOHN DEERE # RE47502

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark = 13,5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE 12,0 h  
 Edition : 05.07.91  
 Replaces : 1.2.91  
 Test oil : ISO-4113  
 Combination no. : 0 401 838 709  
 Injection pump  
 Pump designation : PE8P110A120LS3271  
 EP type number : 0 411 818 723  
 Governor  
 Governor design. : RQV250...1100PA951-2  
 Governor no. : 0 421 813 908

Customer-spec. information  
 Customer : SNF

Engine : WD815.66

1st version kW : 270.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 4- 8- 6- 3-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 4.1...4.3

Del.quantity cm<sup>3</sup>/ : 1.7...2.3

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.90...1.30

2nd speed rpm : 485  
 travel mm : 3.20...3.80

3rd speed rpm : 640  
 travel mm : 4.20...4.80

4th speed rpm : 1145  
 travel mm : 8.40...8.60

5th speed rpm : 1220  
 travel mm : 9.80...10.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 114...122

Testing:  
1st rack travel in: 12.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: ?  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 4.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 4.60  
Speed rpm : 250  
Rack travel in mm : 4.10...4.30

CONSTANT REGULATION  
Speed rpm : 250...390

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 600  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 600  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 380  
Rack travel in m: 10.80...11.00

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 186.0...190.0  
1000 s: (183.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 117.0...119.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...260.0  
1000 s: (216.0...264.0)  
Rack travel in mm : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension =  
1.80...2.00 mm.  
Permissible alteration from 1.60...2.30  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE 12,0 i  
Edition : 05.07.91  
Replaces : 1.2.91  
Test oil : ISO-4113

Combination no. : 0 401 838 710

Injection pump  
Pump designation : PE8P110A120LS3271  
EP type number : 0 411 818 723  
Governor  
Governor design. : RQ300/1100PA958-2  
Governor no. : 0 421 801 570

Customer-spec. information  
Customer : SNF

Engine : WD815.66

1st version kW : 270.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00

M20

Firing order : 1- 5- 4- 8- 6- 3-  
7- 2

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 4.1...4.3

Del.quantity cm3/ : 1.7...2.3

100 s: (1.5...2.5)

Spread cm3 : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.40

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.70  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30  
Rack travel in mm : 2.00  
Speed rpm : 340...380

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 600  
Rack travel in m: 13.40...13.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 600  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 380  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 186.0...190.0  
1000 s: (183.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 117.0...119.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

M21

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...260.0  
1000 s: (216.0...264.0)  
Rack travel in mm : 20.00...21.00

Remarks:

:

Delivery-valve spring pre-tension =  
1.80...2.00 mm.  
Permissible alteration from 1.60...2.30  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE 9,7 f  
Edition : 02.08.91  
Replaces : 19.5.88  
Test oil : ISO-4113

Combination no. : 0 401 846 555

Injection pump  
Pump designation : PE6P110A72ORS516  
EP type number : 0 411 816 176  
Governor  
Governor design. : RQV250...1100PA413-3  
Governor no. : 0 421 813 695

Customer-spec. information  
Customer : STEYR

Engine : WD615.64

1st version kW : 175.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 14.2...14.4

100 s: (13.9...14.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.9...2.4

100 s: (1.6...2.6)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.90...1.30

2nd speed rpm : 350  
travel mm : 1.70...2.30

3rd speed rpm : 650  
travel mm : 4.00...4.60

4th speed rpm : 1150  
travel mm : 8.40...8.60

5th speed rpm : 1250  
travel mm : 9.60...10.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1175

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 142.0...144.0

1000 : (139.0...147.0)



Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 104...112

#### Testing:

1st rack travel in: 13.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1255...1285  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 69...77

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.40...6.60

#### CONSTANT REGULATION

Speed rpm : 250...370

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 860  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 1000  
Rack travel in m: 14.70...14.90  
4th speed rpm : 700  
Rack travel in m: 15.60...15.80

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 15.60...15.80

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 13.30...13.50  
2nd pressure hPa : 575  
Rack travel in m: 15.00...15.10  
3rd pressure hPa : 270

Rack travel in m: 13.60...13.80

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 116.0...118.0  
1000 s: (113.0...121.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...195.0  
1000 s: (171.0...199.0)  
Rack travel in mm : 16.50...17.50

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 m  
Edition : 21.06.91  
Replaces : 14.12.90  
Test oil : ISO-4113  
Combination no. : 0 401 846 566  
Injection pump  
Pump designation : PE6P110A320RS526  
EP type number : 0 411 816 178  
Governor  
Governor design. : RQ275/1000PA818-3  
Governor no. : 0 421 801 534

Customer-spec. information  
Customer : DAF

Engine : LT 160 G

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 13.00...14.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 13.0...14.0  
Difference ° CS : 2.00...4.00

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.20...14.30

Del.quantity cm<sup>3</sup>/ : 15.6...15.8

100 s: (15.3...16.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 8.0...8.2

Del.quantity cm<sup>3</sup>/ : 2.5...3.0

100 s: (2.3...3.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 156.0...158.0

1000 : (153.5...160.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.40

Speed rpm : 1030...1045

2nd rack travel in: 4.00

Speed rpm : 1090...1120  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 8.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 10.70  
Speed rpm : 300  
Rack travel in mm : 8.00...8.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 980  
Rack travel in m: 13.40...13.60  
2nd speed rpm : 600  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 750  
Rack travel in m: 14.00...14.10  
4th speed rpm : 825  
Rack travel in m: 13.60...13.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.20...14.30

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.70...12.90  
2nd pressure hPa : 290  
Rack travel in m: 13.80...13.90  
3rd pressure hPa : 260  
Rack travel in m: 13.20...13.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 980  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (132.0...142.0)  
Aneroid pressure h: -

Speed rpm : 600  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.5...126.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1030...1045

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 280.0...320.0  
1000 s: (276.0...324.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.00...8.20  
Del.quantity cm3/ : 25.5...30.5  
1000 s: (23.0...33.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 10,0 o6  
 Edition : 02.08.91  
 Replaces : 24.10.90  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 745  
 Injection pump  
 Pump designation : PE6P110A32ORS3080  
 EP type number : 0 411 816 722  
 Governor  
 Governor design. : RQV250...1100PA919  
 Governor no. : 0 421 813 776

Customer-spec. information  
 Customer : VOLVO

Engine : TD 100 G

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...174

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X-600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 16.7...16.9

100 s: (16.4...17.2)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 3.9...4.1

Del.quantity cm3/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.10...1.30

2nd speed rpm : 500

travel mm : 4.10...4.90

3rd speed rpm : 700

travel mm : 6.30...6.70

4th speed rpm : 950

travel mm : 6.30...6.70

5th speed rpm : 1100

travel mm : 7.00...7.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1175

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 167.0...169.0

1000 : (164.0...172.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 100  
Minimum rack travel: 5.30  
Speed rpm : 250  
Rack travel in mm : 3.90...4.10

CONSTANT REGULATION  
Speed rpm : 270...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 610  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 280  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 127.0...128.0  
1000 s: (127.0...127.0)

#### BREAKAWAY

1st version

M27

1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...190.0  
1000 s: (156.0...196.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 3.90...4.10  
Del.quantity cm3/ : 15.0...19.0  
1000 s: (12.5...21.5)  
Spread cm3 : 3.00  
1000 s: (6.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 h  
Edition : 28.06.91  
Replaces : 28.3.91  
Test oil : ISO-4113

Combination no. : 0 401 846 826

Injection pump  
Pump designation : PE6P120A32ORS3178  
EP type number : 0 411 826 752  
Governor  
Governor design. : RQV250...1025PA921-2  
Governor no. : 0 421 813 785

Customer-spec. information  
Customer : VOLVO

Engine : TD122FS

1st version kW : 287.0  
Rated speed : 2050

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
                  : (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 25.3...25.5

100 s: (25.0...25.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.8...5.1

Del.quantity cm3/ : 1.7...2.2  
100 s: (1.5...2.5)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.40

2nd speed rpm : 450  
travel mm : 3.60...4.20

3rd speed rpm : 800  
travel mm : 6.30...6.70

4th speed rpm : 1070  
travel mm : 8.00...8.20

5th speed rpm : 1180  
travel mm : 9.90...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 253.0...255.0  
1000 : (250.0...258.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 13.00  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 59...67

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 250  
Rack travel in mm : 4.80...5.10

#### CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.00...14.10

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 90  
Rack travel in m: 10.50...10.60  
3rd pressure hPa : 760  
Rack travel in m: 13.50...13.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 163.0...165.0  
1000 s: (160.0...168.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...310.0  
1000 s: (266.0...314.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.80...5.10  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 5.00  
1000 s: (7.00)

Remarks:

:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 h2  
Edition : 05.07.91  
Replaces : 15.3.90  
Test oil : ISO-4113

Combination no. : 0 401 846 827

Injection pump  
Pump designation : PE6P120A32ORS3178  
EP type number : 0 411 826 752  
Governor  
Governor design. : RQV250...950PA921-3  
Governor no. : 0 421 813 786

Customer-spec. information  
Customer : VOLVO

Engine : TD122F

1st version kW : 257.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 1.7...2.2  
100 s: (1.4...2.5)

Spread cm3 : 0.5  
100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.40

2nd speed rpm : 450  
travel mm : 3.60...4.20

3rd speed rpm : 700  
travel mm : 6.30...6.70

4th speed rpm : 985  
travel mm : 8.10...8.30

5th speed rpm : 1060  
travel mm : 9.40...9.80

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1030

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900



Del.quantity : 229.0...231.0  
1000 : (226.0...234.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 12.00  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 250  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 250...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 90  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 600  
Rack travel in m: 12.50...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 163.0...165.0  
1000 s: (160.0...168.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...310.0  
1000 s: (266.0...314.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (14.5...25.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

Remarks:

:  
Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,3 p 4  
Edition : 26.07.91  
Replaces : 9.11.89  
Test oil : ISO-4113

Combination no. : 0 401 846 898

Injection pump  
Pump designation : PE6P110A72ORS3225  
EP type number : 0 411 816 763  
Governor  
Governor design. : RQV275...1200PA910  
Governor no. : 0 421 813 746

Customer-spec. information  
Customer : DAF

Engine : HS 200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness : 6.00X1.50X600  
x Length mm:

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 12.4...12.6

100 s: (12.1...12.8)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 7.2...7.4

Del.quantity cm3/ : 1.4...1.9

100 s: (1.1...2.1)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.40

2nd speed rpm : 450  
travel mm : 2.90...3.30

3rd speed rpm : 800  
travel mm : 4.70...5.10

4th speed rpm : 1200  
travel mm : 7.80...8.00

5th speed rpm : 1500  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1235

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 124.0...126.0

1000 : (121.5...128.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 11.50  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever  
position degrees: 78...86

Testing:

Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 275  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 280...400

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.50...12.60

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 360  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 270  
Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 87.0...89.0  
1000 s: (84.5...91.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50

N05

Speed rpm : 1240...1250

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.70...4.90

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 d1  
Edition : 05.07.91  
Replaces : 22.3.91  
Test oil : ISO-4113

Combination no. : 0 401 846 901

Injection pump  
Pump designation : PE6P120A320RS3240-1  
EP type number : 0 411 826 787  
Governor  
Governor design. : RQV250...950PA921-17  
Governor no. : 0 421 813 800

Customer-spec. information  
Customer : VOLVO-TRUCK

Engine : TD122FH

1st version kW : 269.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 22.3...22.5

100 s: (22.0...22.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 1.7...2.2  
100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.5  
100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.40

2nd speed rpm : 450  
travel mm : 3.60...4.20

3rd speed rpm : 700  
travel mm : 6.30...6.70

4th speed rpm : 985  
travel mm : 8.10...8.30

5th speed rpm : 1060  
travel mm : 9.40...9.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1030

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 223.0...225.0  
1000 : (220.0...228.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 11.70  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.10  
Speed rpm : 250  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION  
Speed rpm : 250...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.60...9.80  
2nd pressure hPa : 85  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 470  
Rack travel in m: 12.10...12.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 154.0...156.0  
1000 s: (151.0...159.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...310.0  
1000 s: (266.0...314.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 5.00  
1000 s: (7.00)

Remarks:

:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 10,2 a  
Edition : 26.07.91  
Replaces : 19.10.90  
Test oil : ISO-4113

Combination no. : 0 401 846 935

Injection pump  
Pump designation : PE6P120A32ORS3262  
EP type number : 0 411 826 797  
Governor  
Governor design. : RQV300...1050PA232-4  
Governor no. : 0 421 813 883

Customer-spec. information  
Customer : VME

Engine : TD102 GC

1st version kW : 180.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 16.9...17.1

100 s: (16.6...17.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 3.2...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.30...1.70

2nd speed rpm : 500  
travel mm : 2.70...3.30

3rd speed rpm : 800  
travel mm : 4.90...5.50

4th speed rpm : 1100  
travel mm : 7.60...7.70

5th speed rpm : 1180  
travel mm : 8.80...9.20

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 169.0...171.0  
1000 : (166.0...174.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 8.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.90  
Speed rpm : 300  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 300...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 9.20...9.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 160  
Rack travel in m: 9.10...9.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 164.0...166.0  
1000 s: (161.0...169.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...190.0  
1000 s: (156.0...194.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 32.0...37.0  
1000 s: (29.5...39.5)  
Spread cm3 : 5.00  
1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

#### APPLICATION

Loading machine

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 5,9 a  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 937  
 Injection pump  
 Pump designation : PE6P110A32ORS3266  
 EP type number : 0 412 816 777  
 Governor  
 Governor design. : RQV300...1300PA966K  
 Governor no. : 0 421 815 277

Customer-spec. information  
 Customer : VOLVO-TRUCK

Engine : TD63ES

1st version kW : 155.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.40...2.50  
 : (2.30...2.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 780

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 13.1...13.3

100 s: (12.8...13.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 330.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.7...2.1

100 s: (1.4...2.4)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 330

travel mm : 1.80...2.20

2nd speed rpm : 500

travel mm : 3.20...3.80

3rd speed rpm : 850

travel mm : 4.60...5.20

4th speed rpm : 1250

travel mm : 7.90...8.10

5th speed rpm : 1350

travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 780

Aneroid pressure h: 900



Del.quantity : 131.0...133.0  
1000 : (128.0...136.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

#### Testing:

1st rack travel in: 11.40  
Speed rpm : 1360...1370  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 72...80

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 330  
Rack travel in mm : 5.30...5.50

#### CONSTANT REGULATION

Speed rpm : 330...600

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 780  
Rack travel in m: 12.00...12.10

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 1300  
Pressure hPa : 900  
Rack travel mm : 12.40...12.50

##### Measurement

Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 9.00...9.20  
2nd pressure hPa : 110  
Rack travel in m: 9.20...9.30  
3rd pressure hPa : 725  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 1300  
Del.quantity cm3/ : 128.0...134.0  
1000 s: (126.0...136.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 780  
Del.quantity cm3/ : 73.0...75.0  
1000 s: (70.0...78.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1360...1370

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...130.0  
1000 s: (96.0...134.0)  
Rack travel in mm : 10.00...10.50

Remarks:

:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 5,9 a 1  
Edition : 02.08.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 401 846 938  
  
Injection pump  
Pump designation : PE6P110A32ORS3266  
EP type number : 0 412 816 777  
Governor  
Governor design. : RQV300...1300PA966-1  
K  
Governor no. : 0 421 815 278

Customer-spec. information  
Customer : VOLVO-TRUCK

Engine : TD63E

1st version kW : 133.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.40...2.50  
: (2.30...2.50)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 780

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 9.7...9.9

100 s: (9.4...10.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 330.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 1.7...2.1

100 s: (1.4...2.4)

Spread cm3 : 0.7

100 s: (1.1)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 330  
travel mm : 1.80...2.20

2nd speed rpm : 500  
travel mm : 3.20...3.80

3rd speed rpm : 850  
travel mm : 4.60...5.20

4th speed rpm : 1250  
travel mm : 7.90...8.10

5th speed rpm : 1350  
travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 780

Aneroid pressure h: 900  
Del.quantity : 97.0...99.0  
1000 : (94.0...102.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

#### Testing:

1st rack travel in: 10.00  
Speed rpm : 1360...1370  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 72...80

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 330  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 330...600

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 780  
Rack travel in m: 10.00...10.10  
3rd speed rpm : 1050  
Rack travel in m: 10.50...10.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : 900  
Rack travel mm : 11.00...11.10

#### Measurement

Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 8.50...8.70  
2nd pressure hPa : 110  
Rack travel in m: 8.70...8.80

3rd pressure hPa : 480  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1300  
Del.quantity cm3/ : 115.0...121.0  
1000 s: (113.0...123.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 900  
Speed rpm : 1050  
Del.quantity cm3/ : 109.0...115.0  
1000 s: (106.0...118.0)  
Aneroid pressure h: -  
Speed rpm : 780  
Del.quantity cm3/ : 73.0...75.0  
1000 s: (70.0...78.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1360...1370

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 95.0...125.0  
1000 s: (91.0...129.0)  
Rack travel in mm : 9.60...10.10

#### LOW IDLE

Speed rpm : 330  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (14.0...24.0)  
Spread cm3 : 7.00  
1000 s: (11.00)

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

Start-of-delivery setting with ROBO  
diaphragm.

## Note remarks

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Setting point:  
Speed rpm : 650  
Rack travel in mm : 13.5

Testing:

1st rack travel in: 10.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:

Speed rpm : 200  
Minimum rack trave: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.50...7.10  
Rack travel in mm : 2.00  
Speed rpm : 390...430

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 117.0...123.0  
1000 s: (114.5...125.5)  
Spread cm3 : 11.00  
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 d2  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 949  
 Injection pump  
 Pump designation : PE6P120A320RS3240  
 EP type number : 0 411 826 786  
 Governor  
 Governor design. : RQV250...1025PA921  
 -22  
 Governor no. : 0 421 813 942

Customer-spec. information  
 Customer : VOLVO-TRUCK

Engine : TD122FA

1st version kW : 291.0  
 Rated speed : 2050

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.60...13.70

Del.quantity cm3/ : 25.1...25.3

100 s: (24.8...25.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.5...6.7  
 Del.quantity cm3/ : 1.7...2.2  
 100 s: (1.5...2.5)  
 Spread cm3 : 0.5  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.00...1.40  
 2nd speed rpm : 450  
 travel mm : 3.60...4.20  
 3rd speed rpm : 800  
 travel mm : 6.30...6.70  
 4th speed rpm : 1070  
 travel mm : 8.00...8.20  
 5th speed rpm : 1180  
 travel mm : 9.90...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700

Aneroid pressure h: 1200  
Del.quantity : 251.0...253.0  
1000 : (248.0...256.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 12.60  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.10  
Speed rpm : 250  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION  
Speed rpm : 250...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 13.60...13.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 90  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 1000  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700

Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...310.0  
1000 s: (266.0...314.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 5.00  
1000 s: (7.00)

#### Remarks:

:  
Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,3 p11  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 953  
 Injection pump  
 Pump designation : PE6P110A720RS3225Z  
 EP type number : 0 411 816 782  
 Governor  
 Governor design. : RQ275/1200PA913-1  
 Governor no. : 0 421 801 549

Customer-spec. information  
 Customer : DAF

Engine : HS 200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 12.9...13.1

100 s: (12.6...13.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.4...1.9

100 s: (1.1...2.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 129.0...131.0

1000 : (126.5...133.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.70

Speed rpm : 1235...1250

2nd rack travel in: 4.00

Speed rpm : 1320...1350

4th rack travel in: 1450

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring



Speed rpm : 275  
Rack travel in mm : 4.8

Testing:

Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 275  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1200  
Rack travel in m: 13.60...13.80

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.70...12.80

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.90...11.10

2nd pressure hPa : 360

Rack travel in m: 12.10...12.20

3rd pressure hPa : 270

Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 87.0...89.0  
1000 s: (84.5...91.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

Speed rpm : 1235...1250

LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.70...4.90

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,3 p12  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 954  
 Injection pump  
 Pump designation : PE6P110A720RS3225Z  
 EP type number : 0 411 816 782  
 Governor  
 Governor design. : RQV275...1200PA910  
 Governor no. : 0 421 813 746

Customer-spec. information  
 Customer : DAF

Engine : HS 200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00X1.50X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 12.9...13.1

100 s: (12.6...13.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.4...1.9

100 s: (1.1...2.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 450

travel mm : 2.90...3.30

3rd speed rpm : 800

travel mm : 4.70...5.10

4th speed rpm : 1200

travel mm : 7.80...8.00

5th speed rpm : 1500

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1235

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 129.0...131.0

1000 : (126.5...133.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 275  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 280...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 360  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 270  
Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 87.0...89.0  
1000 s: (84.5...91.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70

N21

Speed rpm : 1240...1250

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.70...4.90

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 12,8 c  
Edition : 26.07.91  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 401 848 820

Injection pump  
Pump designation : PE8P120A920/5LS3281  
EP type number : 0 411 828 724  
Governor  
Governor design. : RQV300...1050PA1009  
Governor no. : 0 421 813 938

Customer-spec. information  
Customer : KHD

Engine : BF8L513LC

1st version kW : 243.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.10...3.20  
: (3.05...3.25)  
Rack travel in mm : 15.00...19.00  
Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 18.6...18.8

100 s: (18.3...19.1)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 300.0  
Rack travel in mm : 5.9...6.1

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 2.40...2.80  
2nd speed rpm : 450  
travel mm : 3.40...4.00  
3rd speed rpm : 725  
travel mm : 5.30...5.90  
4th speed rpm : 1100  
travel mm : 9.10...9.30  
5th speed rpm : 1175  
travel mm : 10.00...10.40

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1070  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 750  
Del.quantity : 186.0...188.0  
1000 : (183.0...191.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 86...94

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 210...260

TORQUE CONTROL  
Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 650  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 805  
Rack travel in m: 12.70...12.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 750  
Rack travel mm : 12.90...13.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 450  
Rack travel in m: 12.40...12.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 750  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 186.0...190.0  
1000 s: (183.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 124.0...126.0  
1000 s: (121.0...129.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...195.0  
1000 s: (-)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,6 07  
 Edition : 26.07.91  
 Replaces : 3.8.90  
 Test oil : ISO-4113

Combination no. : 0 401 876 295

Injection pump  
 Pump designation : PE6P120A32ORS415-1  
 EP type number : 0 411 826 123  
 Governor  
 Governor design. : RSV250...1000P5A508-  
 1  
 Governor no. : 0 421 833 194

Customer-spec. information  
 Customer : DAF

Engine : DKZ 1160

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 12.50...12.60

---

Del.quantity cm3/ : 20.6...20.8

---

100 s: (20.3...21.1)

---

Spread cm3 : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 250.0  
 Rack travel in mm : 6.7...6.9  
 Del.quantity cm3/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm3 : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 700  
 Del.quantity : 206.0...208.0  
 1000 : (203.0...211.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 45...53

Testing:  
 1st rack travel in: 11.50  
 Speed rpm : 1035...1045  
 2nd rack travel in: 4.00  
 Speed rpm : 1115...1145

3rd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.0  
Speed rpm : 250  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 630...690

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 400  
Rack travel in m: 13.50...13.70  
3rd speed rpm : 300  
Rack travel in m: 13.80...14.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 12.50...12.60

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.20...10.50  
2nd pressure hPa : 340  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 260  
Rack travel in m: 10.60...11.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 140.0...142.0  
1000 s: (137.0...145.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1035...1045

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 305.0...345.0  
1000 s: (301.0...349.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.40...6.60

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,6012  
 Edition : 26.07.91  
 Replaces : 3.4.87  
 Test oil : ISO-4113

Combination no. : 0 401 876 296

Injection pump  
 Pump designation : PE6P120A320RS415-1  
 EP type number : 0 411 826 123  
 Governor  
 Governor design. : RSV250...1100P5A508-  
 2  
 Governor no. : 0 421 833 195

Customer-spec. information  
 Customer : DAF

Engine : DKX 1160

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.30 (0.75)

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 18.7...18.9  
 100 s: (18.4...19.2)

Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.7...6.9  
 Del.quantity cm3/ : 1.4...2.0  
 100 s: (1.1...2.3)

Spread cm3 : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 700  
 Del.quantity : 187.0...189.0  
 1000 : (184.0...192.0)

Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 102...110

Testing:  
 1st rack travel in: 10.60  
 Speed rpm : 1135...1145  
 2nd rack travel in: 4.00  
 Speed rpm : 1200...1230



3rd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1430  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.0  
Speed rpm : 250  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 600...700

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.60...12.80  
2nd speed rpm : 400  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 300  
Rack travel in m: 12.90...13.40

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.60...11.70

#### Measurement

Speed 1/min : 600  
1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 300  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 255  
Rack travel in m: 10.80...11.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 140.0...142.0  
1000 s: (137.0...145.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1135...1145

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 290.0...330.0  
1000 s: (286.0...334.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.40...6.60

Remarks: